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Filterable Forms of Tuberculosis Virus.—Pure and mixed cultures of tubercle bacilli were used to determine the effect of other microörganisms upon the formation of filterable elements of tubercle bacilli. All precautions regarding filtration were taken, and animals were inoculated from every filtrate, as well as from a mixture of two filtrates, to exclude the possibility of a sexual increase, which is believed to exist according to Almquist and Enderlein. Egg, gelatine, agar, peptone, water and bouillon of each filtrate and from mixtures of two filtrates were inoculated. All the tests proved negative culturally, and in animal experiments macroscopically and microscopically. Certain animals became allergic as the result of preliminary treatment with timothy bacilli and Old Tuberculin, or bacillary-free filtrates of an oil-extract of tubercle bacilli. An interesting concomitant finding occurred in two of the nontuberculous animals with negative Old Tuberculin reactions, that revealed acid-fast bacilli in the unchanged lymph nodes tributary to the tuberculin reactions set up by Old Tuberculin. An exception to the negative experiments was especially one positive experiment, in which a large amount of filtrate caused growth, which upon filtration gave a residue of non-acid-fast and sparse acid-fast forms. Two guinea pigs inoculated with this material died within 13 to 18 days with severe toxic symptoms. Transplants from the sediment gave sparse growths and further planting was negative. One three-months-old culture revealed a highly virulent bovine tubercle bacillus colony corresponding to the original strain. It is believed that viable elements can pass the filter, and form non-acid-fast types, which may occasion the toxic symptoms noted. The proof of this can only be determined *in vitro*, in that non-acid-fast forms can be obtained from the Koch bacillus and again be transformed into it.—*Untersuchungen zur Methode des Nachweises filtrabler Formen des Tuberkulose-Virus durch den Tierversuch. Mit Versuchen zur Tuberkulinreaktion, O. Kirchner, Beitr. z. Klin. d. Tuberk., 1930, lxxiv, 521.*—(*H. J. C.*)

Filterability of Tubercle Bacilli.—The presence of granules in the sputum in outspoken chronic and favorable cases of tuberculosis, as maintained by Skutetzky, was verified. Aside from the well-known frequent occurrence of the form designated by Koch as spores, there occurred not rarely larger oval bodies resembling tetanus spores. The former were revealed following gram-staining, while the latter could be seen with the Ziehl-Neelsen stain, and are probably identical with the bodies described by Babes

in 1886 who deserves priority over Much. They are viewed as spore-like plasma concentrations which develop under unfavorable influences. If sputum, containing numerous small granules, is neutralized with dilute sodium hydroxide and filtered through a Berkefeld filter, both forms are found in the filtrate. The smaller granules predominate after filtration through a Chamberland L3 filter. Only rarely were actual bacilli found in the filtrate. The injection of these filtrates into guinea pigs resulted in the finding of atypical granular bacillary forms in clusters, but also as individuals, but they did not produce typical tuberculosis and the infection proved transient. In filterable viruses such granules play an important rôle (the elementary corpuscles of Prowazek, the *Strongyloplasm* of Lipschütz). Actinomycosis was also studied and there were found, besides the ordinary forms, the usual segmentation granules.—*Die Filtrierbarkeit der Tuberkelbacillen und anderer Bakterien, F. Lucksch, Centralbl. f. Bakt., I. Orig., 1930, cxvii, 1.*—(*H. J. C.*)

Determination of Phagocytosis of Tubercle Bacilli *in Vitro*.—Ten drops of blood (finger) are taken in a Pasteur pipette, and mixed with an equal amount of 1.5 per cent sodium-citrate solution, and the mixture is washed twice with an equal amount of sodium chloride, using a centrifuge for separation. Three drops of the leucocytic layer are transferred to a small tube and a double volume of standardized bacillary emulsion is added. The mixture is incubated at 38° for one hour, and is used to prepare a smear after shaking. The smear is fixed with methyl alcohol in the incubator until dry, and is then stained with Ziehl's solution, decolorized with 2.5 per cent sulphuric acid, and counterstained with methylene-blue. The bacillary emulsion is prepared from a one-week-old culture in liquid medium according to Besredka. The sediment after centrifugation is well mixed with salt solution in a mortar, grinding for 35 to 40 minutes. The opalescent emulsion is standardized against a known emulsion, so that, in each immersion field with an ocular 4, ten bacilli are found: 200 leucocytes are counted for tubercle bacilli. The phagocytosis was found to be dependent upon the severity of the disease and the toxicity of the tubercle-bacillus strain used. The more severe the disease and the greater the toxicity of the strain, the weaker was the resulting phagocytosis.—*Eine Methode zur Phagocytosebestimmung der Tuberkelbacillen mit den Phagocyten des tuberkulösen Menschen in vitro, N. Westenrijk, Ztschr. f. Tuberk., 1930, lvii, 393.*—(*H. J. C.*)

Bacillaemia in Experimental Tuberculosis.—It is now probably generally accepted that in tuberculosis a bacillaemia occurs at some stage of the infection, but the question of when it begins and how long it persists is still unsettled. In 1868, Villemin showed that normal rabbits injected subcutaneously with the blood of a tuberculous rabbit, or of phthisical patients, developed tuberculous lesions. Numerous investigations on this subject have been made since that time. Recently Löwenstein and Russeff obtained positive cultures in all cases of miliary tuberculosis, tuberculous meningitis and third-stage pulmonary tuberculosis, and in 6 of 8 cases of surgical tuberculosis. Löwenstein continuing this work obtained positive blood cultures from 169 of 325 cases. His series includes tuberculosis of the lungs, skin, larynx, kidneys, bones and eyes, and also 21 cases of acute rheumatism, all of which gave positive cultures. One source of difficulty in detecting *B. tuberculosis* in the blood and other pathological materials has been revealed by the investigations into the biology and morphology of this organism. A considerable number of experiments on record tend to show that material from tuberculous lesions contains a filterable form of the tubercle bacillus. This has been denied by several authorities and the matter cannot be regarded as finally settled. The weight of evidence at present appears to be against the filterability of the infecting material through the finer filters, such as Seitz and Chamberland L5. The existence of non-acid-fast forms of *B. tuberculosis* in culture has long been known. A great variety of non-acid-fast forms have been described, from filter-passing granules to mycelial and yeast-like forms. The main result of these researches has been to relegate the tubercle bacillus of Koch's classic description to a comparatively minor place in the pathogenesis of tuberculosis. It appears to be a resting stage of the organism and possibly its least active form. In the course of some experiments on the growth of *B. tuberculosis*, a human strain, TB100, was grown in the depth of veal-peptone bouillon. A fairly heavy inoculum was submerged in this medium, and incubated for three months at 37°C., when the culture started to grow in the form of small granules at the bottom of the flask. These granules were transferred to other flasks containing 500 cc. of the medium. A series of subcultures was carried on in this way for three and one-half years. No tendency to produce typical surface growth was observed. Similar cultures have been obtained in the same way from two other strains of human origin and from two strains of *BCG*. Cultures

grown in this way will be referred to as deep cultures. Microscopically, the granules in the deep cultures consist of acid-fast rods with a considerable proportion of non-acid-fast forms. If, instead of counterstaining in the usual way, a wet preparation is made by placing a drop of dilute methylene-blue on the fixed smear, previously stained with carbol-fuchsin and decolorized, and a coverslip placed over the methylene-blue, a much greater proportion of non-acid-fast organisms can be seen. The depth of the stain continues to increase for about an hour, and more and more organisms take up the stain and become visible as time goes on. If a certain field be marked, the coverslip removed, and the excess stain washed off and the marked field reëxamined, it will be seen that the greater number of very faintly staining rods and even some of those more deeply stained, have lost their stain and are no longer visible. On adding another drop of methylene-blue they again become visible. In a thin preparation from an actively growing culture numerous pairs of bacilli in a "V" or parallel arrangement may be seen. One of these is usually more or less acid-fast, while the other has taken up the counterstain. This arrangement occurs so regularly that it seems highly probable that the non-acid-fast member has grown directly from the acid-fast one, and that it increases in size and intensity of staining with age. It is probable that these nonstaining organisms are of the greatest importance in the biology of the tubercle bacillus, and in the aetiology of rapidly progressing tuberculous lesions. The organisms from the deep cultures were occasionally, but by no means invariably, very much more virulent than cultures of the same strain grown on Petroff's medium. Positive cultures were obtained from the heart-blood of two of the guinea pigs which died 16 days after infection. Cultures of the heart-blood have been taken as a routine from practically all animals dying after infection with *B. tuberculosis*. In the course of this work it was found that solid media were not very suitable. For all later work, bouillon and glycerine-bouillon alone were used. From 0.1 to 0.5 cc. of blood is added to 10 cc. of bouillon. Positive results have been obtained with quantities of 0.1 to 1 cc. but 0.3 to 0.5 cc. is probably the most suitable amount. After incubating for 14 to 60 days at 37°C. the clot, or a portion of it, is crushed between two slides, smeared out, dried, fixed and stained by Ziehl-Neelsen. In later experiments, direct smears of the heart-blood were examined. Occasionally acid-fast bacilli could be detected, usually within the leucocytes. Of 182 animals, 160 gave positive cultures from the heart-blood at postmortem. In another experiment blood cultures were made from a group of animals whose resistance to infection had been increased by vaccination. A smaller proportion of positive cultures was obtained than from normal animals infected at the same time with the same dose of *B. tuberculosis*. From 59 control guinea pigs with an average life of 57 days, 93.2 per cent positive blood cultures was obtained. From 30 vaccinated guinea pigs with an average life of 73 days, 70 per cent positive blood cultures was obtained. From a group of 25 guinea pigs where vaccination resulted only in greater sensitiveness to infection, the average life being 50 days, 96 per cent positive blood cultures was obtained. Thus there is an indication that vaccination results in a considerable decrease in the percentage of positive blood cultures.—*Bacillaemia in Experimental Tuberculosis together with Experiments on Mutation and Pathogenicity of a Human Strain of B. Tuberculosis, G. Dreyer and R. L. Vollum, Lancet, May 9, 1931, ccxx, 1015.*—(*F. G. P.*)

Humoral Allergy in Tuberculosis.—It has been stated recently, as the result of experiments with the isolated cells of allergic animals, that the cellular injury and necrosis associated with tuberculous allergy result from a change in the fixed tissue and blood cells. This change is said to render these cells more sensitive to the products of the tubercle bacillus. How can the cells become allergic without the intervention of circulating antibodies or specific substances in the plasma or lymph? To demonstrate that humoral factors play an important rôle in the phenomena of allergy and immunity in tuberculosis is the purpose of the present paper. The infrequent failure to transfer allergy to the nontuberculous animals cannot justify a sweeping generalization that humoral antibodies are without significance in the production of allergy. The antibody content of the blood in tuberculosis may not be sufficiently high for passive sensitization and immunization. In a previous work it has been shown that tuberculin fractions and toxic filtrates of tubercle cultures can produce allergy in normal animals. Hence the belief that allergy cannot be developed in the normal animal without the presence of tubercle may have to be revised. Intracutaneous and intraperitoneal studies were made with Berkefeld filtrates of cultures of tubercle bacilli in tuberculous and normal guinea pigs. Human tubercle bacilli (H37) were the organisms used and the filtrates were prepared from hormone broth cultures after five to

eighteen days' incubation. Comparative studies included filtrates prepared from extracts of focal tubercle tissue obtained from the skin of guinea pigs previously treated intracutaneously with bacilli (H37). Neutralization tests were made by intracutaneous and intraperitoneal methods, using an immune serum prepared in the goat by subcutaneous injections of the Berkefeld filtrates over a period of two years. The intracutaneous experiments resulted as follows: *1:* The Berkefeld filtrates gave an immediate reaction in tuberculous guinea pigs with the general picture of wheal formation. Twenty-four hours later the tuberculin reaction became apparent. In normal guinea pigs local reactions did not occur. *2:* The immune goat-serum contained antibodies that produced a reaction in tuberculous guinea pigs best described as an allergic tubercle. Beginning as a mild inflammatory response after twenty-four hours, the reddening persisted for another day or two, when induration became more pronounced and umbilication was marked. In normal animals the reaction did not occur. *3:* Combination of immune goat-serum and Berkefeld filtrates in varying proportions exhibited definite neutralizing properties of the serum under certain conditions. *4:* Filtrates prepared from focal tuberculous tissues were inactive. The intraperitoneal experiments gave the following results: Toxic Berkefeld filtrates freshly prepared from young cultures of tubercle bacilli caused typical immediate or delayed reactions that resulted in death or a chain of symptoms followed by recovery. Heating the filtrate to a temperature of 100°C. for one to two hours modified or prevented symptoms. These reactions did not occur in the normal guinea pig. Comparison of the behavior of filtrates with ordinary Old Tuberculin under identical conditions showed definitely marked qualitative and quantitative differences. Primarily, irrespective of the dosage, injections of diluted O.T. did not produce any immediate or delayed reactions that were in any manner characteristic of or analogous with those elicited with the filtrates. The filtrates were not concentrated before use; the dose injected was proportionately smaller than that of tuberculin; and the culture from which the filtrates were prepared represented relatively short periods of bacterial growth (five to eighteen days) as against six to eight weeks for tuberculin. Even the filtrates from five-day cultures were found to be highly toxic. The neutralization of the Berkefeld filtrates by the immune serum was considered a specific phenomenon for the following reasons: Normal goat-serum failed to protect tuberculous guinea pigs under identical conditions; the filtrates were innocuous for the normal guinea pig; the immune serum did not prevent the lethal action of diluted tuberculin, and in this respect did not differ from normal goat-serum. Immune goat-serum alone caused irregular reactions at times and, rarely, death, depending on the dosage. Normal goat-serum alone gave negative results. The test animals (guinea pigs) used in these experiments were injected with virulent human tubercle bacilli (H37). *Conclusion:* Toxic (Berkefeld) filtrates of tubercle bacilli cultures appear to contain antigenic and allergenic substances.—*Tuberculotoxins and Their Significance in Allergy and Neutralization Phenomena, F. Eberson and M. A. Sweeny, J. Immunol., June, 1931, xx, 395.*—(*J. S. W.*)

Nature of Antigen in Hypersensitiveness.—Recent investigations have shown that the tuberculin type of sensitiveness in the case of several bacteria is associated with the protein antigens, while others, as the carbohydrate antigen of the pneumococcus and the tubercle bacillus, never produce this type of sensitization, but elicit acute anaphylaxis and play the main rôle in the precipitin reaction. Crystalline egg-albumin and egg-globulin differ considerably in their relationship to the different manifestations of hypersensitiveness. The crystalline egg-albumin, when injected in tuberculous lesions of guinea pigs, tends to produce in the animal those manifestations of hypersensitiveness which are mediated by antibodies (anaphylactic type). Under the same conditions, egg-globulin tends to produce manifestations in which those of active immunization play the more important rôle (tuberculin type of sensitiveness). Thus, the difference between the antigens lies in their capacity to produce a different type of sensitization. The author has been able to produce the tuberculin type of skin sensitiveness with innocuous antigens, such as egg globulin and albumin, horse-serum, timothy pollen, etc., but never with bacterial antigen.—*Comparative Study of the Anaphylactic and Tuberculin Types of Hypersensitiveness. II. The Influence Exerted by the Nature of the Antigen on the Development of the Different Types of Hypersensitiveness, L. Dienes, J. Immunol., May, 1931, xx, 333.*—(*J. S. W.*)

Specificity of Avian Tuberculin Reactions.—The several reports of L'Esperance on the finding of the avian tubercle bacillus in the lesions of Hodgkin's disease have stimulated interest in the question of the infectiousness of this microörganism for human beings. The question is now asked:

What is the value of the reaction with avian tuberculin in the diagnosis of avian infection? This question is fundamental and involves the specificity of the reaction that can be elicited with the tuberculins made from the three more important types of tubercle bacilli. From a review of the literature, the collected experiments on animals indicate that avian tuberculin, while very active when confronted with avian tuberculosis infection, produces much weaker reactions in animals infected with mammalian types of tubercle bacilli. Similarly, mammalian tuberculins are less active in avian than in mammalian tuberculosis. Thus, both groups of tuberculins show weaker reactions with a different type of infection than they show with a corresponding type. In human beings four authors reported strong reactions with avian tuberculin when there was practically none to human tuberculin (nonpulmonary tuberculosis); three authors found no positive reactions with avian tuberculin in large groups of tuberculous children; and other investigators reported a varying percentage of cases showing positive reactions with avian tuberculin, always with a positive response to at least one tuberculin of a different type. From the literature it is seen that, except in a very few cases of tuberculosis of the kidney and skin (from which avian tubercle bacilli were isolated), there was no direct bacteriological support of the specificity of the reaction with avian tuberculin. Furthermore, there was no bacteriological evidence presented to show that a positive reaction with avian tuberculin in human beings does not indicate the existence of an avian infection together with mammalian tuberculosis. One case of Hodgkin's disease (diagnosed by biopsy) gave a positive intracutaneous reaction to avian tuberculin in a dilution of 1:10,000, while with human tuberculin, even at a dilution of 1:100, the reaction was negative. The source of the tuberculins is not mentioned. This result confirms one previously observed by L'Esperance and is interpreted to indicate either an active or latent infection with avian tubercle bacilli. Intracutaneous tests with avian tuberculin were made on 62 patients with advanced pulmonary tuberculosis. At the Sea View Hospital, New York, the dilutions used were 1:1,000 or 1:5,000. The results showed 36 positive, 3 doubtful and 23 negative. Because of the definite objections of the clinical staff of the hospital to the use of human tuberculin, even for skin tests, other tuberculins were not used for comparison. The question arises whether a positive reaction to avian tuberculin in pulmonary tuberculosis indicates a mixed active infection with the avian tubercle bacillus; or a latent infection, with the avian bacilli perhaps confined to the lymph nodes; or whether it is a group reaction in persons infected with other types of tubercle bacilli; owing to the similarity of their tuberculins. In order to test this question it was necessary to look for the avian tubercle bacillus in a number of persons who showed positive reactions with avian tuberculin. For control a series of patients was examined who presented negative reactions with avian tuberculin. Several instances have been reported of the isolation of avian tubercle bacilli from the sputa of tuberculous individuals. The method employed was that of inoculation of the material into chickens, which are susceptible to avian but not to mammalian tubercle bacilli (at least in intravenous and intraperitoneal inoculations). The materials used were sputa rich in tubercle bacilli and material obtained at autopsy, namely, tuberculous lung tissue and peribronchial lymph nodes (the latter as a possible site of a latent infection with the avian tubercle bacillus). Sixteen chickens were inoculated with material from tuberculous individuals showing positive reactions with avian tuberculin; 12 chickens were inoculated with material from tuberculous patients negative to avian tuberculin; and 8 chickens were inoculated with material from untested persons. In all cases the inoculated material contained large numbers of acid-fast bacilli. The results of the experiments were negative, for none of the chickens developed tuberculosis. *Conclusions:* A positive reaction to avian tuberculin, observed in many cases of pulmonary tuberculosis, does not indicate an active mixed infection with human and avian tubercle bacilli or latent infection with avian bacilli. Such a reaction must be considered a "group" reaction due to the similarity of avian and mammalian tuberculins. When the reaction to avian tuberculin is positive and the reaction to other tuberculins is negative or considerably weaker, infection with avian tubercle bacilli may be assumed to exist. Tuberculosis does not develop in chickens when they have been inoculated intravenously or intraperitoneally with large amounts of mammalian bacilli.—*The Specificity of Avian Tuberculin Reactions, V. B. Dolgopol, J. Infect. Dis., September, 1931, xlix, 216.—(J. S. W.)*

Preparation of Pure Tuberculin.—An effective tuberculin was made by growing tubercle bacilli on the albumin-free medium of Sauton. This tuberculin contained, besides the specific substance that is fatal to tuberculous guinea pigs, carbohydrates and proteins which are derived from the

tubercle bacillus only. Lethal doses of this tuberculin were determined by subcutaneous injection into guinea pigs. The residue of the culture solution (salt and glycerine) was removed from the sterile, filtrated Sauton tuberculin by dialysis through fish-bladders. Then the higher molecular proteins were precipitated at an acid pH. It was found also that the specific substance in the tuberculin was essentially "acid-stable" and that the effectiveness of the tuberculin was not lessened by this process. The proteins of lower molecular composition and the carbohydrates remained in the residual solution; the specific substance was then absorbed by kaolin, from which mixture a purified tuberculin, free from carbohydrates, was recovered by treatment with ammonia. The specific substance has been recovered in a concentration 21 times greater than the original tuberculin. It was not determined whether the specific substance belonged to the polypeptids.—*Ueber Gewinnung und Reinigung von Tuberkulin, E. Maschmann and E. Küster, Deutsche med. Wchnschr., January 23, 1931, lvii, 143.—(H. S. W.)*

Standardization of Tuberculin.—In Germany tuberculin is tested in the State Institute for experimental therapeutics at Frankfurt-a-Main by comparing it with a standard tuberculin. It is tested in regard to its lethal dose on guinea pigs, sterility and phenol content. Employing a method similar to Willstaetter's ferment-purification method, a purer tuberculin was obtained, which had a potency 21 times as great as the primary tuberculin, as judged by the size of the lethal dose. Dialysis experiments showed that the substance causing the specific skin reaction and that producing lethal effects in guinea pigs are not identical.—*Purification and Valuation of Tuberculin, E. Kuester, J. State Med., October, 1931, xxxix, 605.—(J. P. B.)*

Stability of Tuberculin.—The activity of tuberculin dilutions was determined during a period of some three to four years. The weaker dilutions, 1:10,000 and 1:1,000 preserved with tricresol were examined from time to time, but the 1:100 and 1:10 dilutions only at the end of the experiment, as they were considered to be more stable than the weaker ones. It was found that these dilutions, made with 0.2 per cent aqueous tricresol as a preservative, keep for months with little loss of potency. Therefore it would seem safe to keep stock dilutions of 1:10 or 1:100 for a year or more without practical loss of activity.—*The Keeping Quality of Tuberculin Dilutions, J. D. Pilcher, J. Am. M. Ass., May 30, 1931, xcvi, 1868.—(G. L. L.)*

Evaluation of Tuberculin.—A questionnaire sent to 34 institutions in 16 different countries revealed that Old Tuberculin was prepared in various ways from human, bovine, and at times horse, porcine or avian tubercle bacilli. The composition of the glycerol-bouillon and the incubation period varies, as well as the concentration, heat sterilization and addition of antiseptics. The evaluation was performed according to the Koch-Dönitz (lethal shock) procedure, the intracutaneous reaction on tuberculous animals and the practical test on tuberculous human beings. It is questionable whether the lethal shock and the skin allergy are dependent upon the same antigen. The intracutaneous reaction in tuberculous guinea pigs is markedly specific, and this method is recommended, with retesting on tuberculous individuals. A comparison of the Old-Tuberculin preparations of Frankfort, Paris and Tokio gave equal results.—*Die einheitliche Wertbestimmung des Tuberkulins auf Grund der Untersuchungen des Hygienekomitees vom Völkerbund, C. Prausnitz, Ztschr. f. Tuberk., 1930, lvii, 69.—(H. J. C.)*

Fermented Tuberculin.—In previous articles the author described the preparation of the atoxic antigen of fermented tuberculin. This tuberculin was used in various types of phthisis, and predominantly in advanced and hyperpyretic cases. The fermented tuberculin causes liquefaction of the tubercle, followed by a fibrosis, with resulting contraction and sclerosis of the diseased lung.—*Allgemeine Beobachtungen bei Anwendung gegorenen Tuberkulins, A. Komis, Ztschr. f. Tuberk., 1930, lv, 323.—(H. J. C.)*

Influence of Light on Tuberculin.—Old-Tuberculin solutions, rayed with ultraviolet light, were not able to cause intracutaneous reactions in tuberculous guinea pigs, and likewise did not possess the power in suitable doses to kill tuberculous guinea pigs. This is contrary to the results obtained in man, in whom rayed tuberculin produced focal and general reactions. The author explains this action on the basis that either unchanged tuberculin still remains in the rayed solution or that the reactions in man must be considered as nonspecific.—*Der Einfluss des Lichtes auf Tuberkulin. III. Mitt., A. Fischer and W. Hausmann, Ztschr. f. Tuberk., 1930, lviii, 328.—(H. J. C.)*

Cytotoxic Action of Tuberculin.—The following experiments were undertaken to ascertain whether tissue culture methods are applicable in determining the specificity of the cytotoxic action of tuberculin prepared from the human, bovine and avian types of tubercle bacilli and from various other strains of acid-fast bacteria. The tuberculins were prepared by growing the acid-fast bacteria on beef-infusion-broth containing 3 per cent glycerol. The tissue to be cultured was removed under sterile conditions and placed in Locke's solution. Plasma was obtained by bleeding guinea pigs or chickens from the heart and mixing the blood with a 0.1 per cent solution of heparin in Locke's solution. The embryonic extract was obtained by centrifugating finely minced chick embryos from 8 to 10 days and diluting the supernatant fluid with an equal amount of Locke's solution. The action of the different tuberculins was determined by adding varying dilutions of each tuberculin to sterile cover-slips on which minute bits of tissue previously washed in several changes of Locke's solution had been placed. A drop of plasma and a drop of diluted embryonic extract were added and the cover-slip then inverted over the well of a hollow-ground glass slide. The edges of the cover-slips were sealed and the cultures were incubated at 37°C. As a control explants of tissues were prepared without tuberculin. The results showed that tuberculin from the human and bovine types of tubercle bacilli inhibits the growth of cells from explants of bone-marrow, spleen and testes of tuberculous guinea pigs, and is toxic for these cells, but has no effect on explants of the same tissues from nontuberculous animals. "Tuberculin" from other acid-fast bacteria has no inhibitory or toxic action on explants of tissues from either tuberculous or nontuberculous guinea pigs. Tuberculins from the avian, bovine and human types of tubercle bacilli as well as "tuberculin" prepared from the Duval and from the Kedrowsky strains of *M. leprae* inhibit the growth of cells of explants of spleen and bone-marrow of tuberculous fowls and are toxic for these cells, but have no effect on the explants from tissues of nontuberculous chickens. "Tuberculins" from other acid-fast bacteria have no effect on the growth of explants of tissues from tuberculous or from nontuberculous fowls. Tissue-culture methods indicate that the sensitivity of tuberculous tissues to tuberculin is inherent in the cell, and that it cannot be passively transferred.—*The Specific Cytotoxic Action of Tuberculin in Tissue Culture, J. D. Aronson, J. Exper. Med., September, 1931, liv, 387.*—(*F. G. P.*)

Sensitiveness to Tuberculin.—Intracutaneous tuberculin tests were made on 100 tuberculosis patients and 100 nontuberculous individuals. There was a definite tendency to a higher sensitiveness in tuberculosis patients, as indicated by a greater number of positive results with more dilute solutions of tuberculin. In the nontuberculous group there was no difference between the constitutional state of the strongly positive reactors and those in whom the reaction was negative or only weakly positive; whereas, in the tuberculous group, the strongly positive reactors were in a much better constitutional state than the negative or only weakly positive. A low or negative sensitiveness to tuberculin goes, in the tuberculous, with a severe and progressive type of disease and suggests that in the infected but clincally nontuberculous the constitutional state cannot be regarded as explaining the difference between the strongly positive and the weakly positive or negative reactors. This difference must depend upon the relative extent and activity of "larval" lesions which are still below the "clinical" threshold. The sensitiveness of actively resisting cases is very much greater than the average sensitiveness of persons free from clinical tuberculosis. On the whole, and more especially in males, tuberculin sensitiveness seems to be greater in younger patients.—*Investigation and Assessment of One Hundred Cases of Pulmonary Tuberculosis, S. L. Cummins and S. B. H. Walker, Tubercle, July, 1931, xii, 436.*—(*M. E. P.*)

Desensitization in Tuberculous Guinea Pigs.—The importance of noting the bodily condition when tuberculin is given to guinea pigs is obvious. The systemic condition of the animal, as expressed by limpness of the muscles, inactivity, failure to eat, and general prostration, has been termed the "systemic test." A series of experiments were performed to determine the value of the systemic test for measuring desensitization in tuberculous guinea pigs; to find the antigen most suitable for desensitization; and to find the best dose of antigen. As indicated by the systemic test, considerable desensitization was secured in tuberculous guinea pigs treated with certain antigens. Desensitization spared the lives of the animals to a considerable extent against the administration of a 25-mgm. dose of Old Tuberculin. Heat-killed tubercle bacilli, iodine-killed tubercle bacilli, and Old Tuberculin are unsuitable antigens for desensitization of tuberculous guinea pigs. Ether-killed and treated antigens of both virulent and nonvirulent tubercle

bacilli and of *Mycobacterium smegmatis* caused desensitization to about the same degree in tuberculous guinea pigs when injected in suitable doses. Tuberculoproteins are promising antigens for desentization. A dose of 1 mgm. of bacillary antigen generally gave greater desensitization than smaller doses; larger doses tended to kill the animals. The systemic test, as used in this investigation, was found to be unsatisfactory, due to the toxic properties of Old Tuberculin. Theoretically, the value of the test is not altered; only the reagent is found deficient; it is hoped that purified tuberculin, S. M. T., as prepared by Seibert, and containing only the proteins of the tubercle bacillus, will prove more satisfactory.—*Desensitization in Tuberculous Guinea Pigs as Measured by the Systemic Test, J. Weinzirl and J. D. Thayer, Tubercle, August, 1931, xii, 488.*—(*M. E. P.*)

Hypersensitiveness of Tuberculous Animals on Acid Diet.—Guinea pigs were infected with tubercle bacilli, and three weeks later half of the animals were placed on an acid diet and the remainder on a regular mixed diet. The tests were performed, after the development of an outspoken acidosis, by injections of 0.1 cc. of a 1–5 dilution of Old Tuberculin given intracutaneously. The readings were made after 48 hours, and at the same time the alkali reserve in the blood was determined. Animals with a normal alkali reserve had a more marked skin reaction than mildly "acid" animals, while markedly "acid" animals as a whole gave more marked skin reactions than those weakly "acid."—*Tuberkulinempfindlichkeit tuberkulöser Meerschweinchen bei saurer Kost, E. H. Michalowsky, Ztschr. f. Tuberk., 1931, lix, 321.*—(*H. J. C.*)

Experiments with Ozone and Rayed Codliver Oil.—Preliminary or subsequent treatment of guinea pigs infected with tuberculosis did not prove water-extracts of ultraviolet-rayed or ozone-treated codliver oil to protect these animals against tuberculosis or to change the course of the disease. The ozone-water-treated animals had an increase in indurative changes around the lesions, however.—*Prophylaktische und therapeutische Versuche mit Wasserextrakt aus ultravioletbestrahltem bzw. ozonbehandeltem Fischlebertran bei experimenteller Meerschweinchentuberkulose, R. Bergman, J. Möllerström and O. Reuterwall, Ztschr. f. Tuberk., 1930, lvii, 50.*—(*H. J. C.*)

Sensitiveness to Fungi.—Because of the omnipresence of saprophytic fungus spores and the frequency with which patients with asthma give positive reactions to dust, it was deemed advisable to test the sensitivity of the skin of a group of asthmatic patients to filtrates and extracts of fungus cultures. The strains used were isolated from the dust of rooms occupied by patients with asthma or eczema. Of the 55 patients tested, eighteen were included because of positive skin tests to dust. The majority were chronic cases in which the causes of asthma had not been determined by routine testing. Of the fifty-five, 5 patients reacted to one or more fungi with the production of wheals having definite pseudopods and a surrounding flair. Tests were made also with diluted filtrates of the broth in which the fungi had grown, but the results seemed of little significance on account of the high percentage of severe reactions observed in control tests with uninoculated broth in both asthmatic and non-asthmatic patients. —*Observation on Sensitivity to Dust Fungi in Patients with Asthma, C. A. Flood, J. Am. M. Ass., June 20, 1931, xcvi, 2094.*—(*G. L. L.*)

Induced Increase of Susceptibility of Guinea Pigs to Tuberculosis.—Guinea pigs were placed on a diet deprived of vitamines, proteins and minerals. They were housed in a darkened compartment with heavy atmospheric humidity and a widely varying temperature for several days. The animals became very susceptible to tuberculous infection so that specific lesions developed within five or six days after inoculation with infected material.—*Su un trattamento dietetico della cavia per la rapida diagnosi della tubercolosi, F. Guarnieri, Tubercolosi, September, 1931, xxiii, no. 9, 325.*—(*U. E. Z.*)

Haemoptysis.—In cavernous tuberculosis, haemorrhage is usually due to the rupture of aneurysmal dilatations within the cavity. Bleeding also occurs when a fresh tuberculous haemorrhagic alveolitis develops around an old lesion. Toxins of tubercle bacilli may give rise to congestion and subsequent haemorrhage, such as often follows tuberculin injections. Drugs used in the treatment of tuberculosis produce many haemorrhages. Changes in blood-pressure within the pulmonary artery may also cause haemoptysis.—*La tubercolosi emoftoizzante, A. Ricci, Tubercolosi, May, 1930, no. 5, 197.*—(*U. E. Z.*)

Shift to Left of Leucocytes in Tuberculosis.—The author sought to obtain information regarding the shift to the left during the various forms of pulmonary tuberculosis, in which he followed the Re-

deker scheme, and found that in most of the early infiltrations, secondary infiltrations and cases of cavernous pulmonary tuberculosis, as well as probably miliary tuberculosis, there was present a shift to the left in the blood-picture, while in the indurated primary complex and the induration periods of the early infiltrate or secondary infiltration this phenomenon did not occur. The shift to the left, like so many other general features, is not an obligatory index of tuberculosis, since in rare cases it was not present even with the existence of activity. In the early stages of pulmonary tuberculosis the change in the blood-picture is slight. There is a certain parallelism between the shift to the left, the patient's general well-being, the temperature and the weight.—*Die Linksverschiebung im weissen Blutbild bei der Tuberkulose, M. Guggenheim, Beitr. z. Klin. d. Tuberk., 1930, lxxiii, 625.*—(*H. J. C.*)

Paravertebral Dulness.—In percussing for paravertebral dulness it should be borne in mind that slight deformities of the vertebral column may produce changes in the percussion sound regardless of deeper structures. As far as the deeper structures are concerned, a variety of organs may produce such percutory alterations. An enlargement of the left auricle may cause a slight dulness to the left of the 2nd to 4th or the 5th to 7th thoracic vertebra. An exudative pericarditis may produce a triangular region of dulness on the left side. Dilatation of the ascending aorta causes dulness to the right of the 1st to 3rd spinal process. Dilatation of the descending aorta causes dulness to the left of the middle and lower portions of the thoracic spine. It should be remembered that pleural effusions produce a triangular paravertebral dulness in the lower region of the contralateral side. Large hilar lymph nodes, regardless of the cause of the enlargement may be diagnosed by a paravertebral unilateral or bilateral dulness in the level of the 2nd to 5th vertebra. This dulness frequently does not run parallel with roentgenologically demonstrable shadows. Diverticula, tumors and stenoses of the oesophagus may be the cause of paravertebral dulness. When caries of a vertebra produces a cold abscess, bilateral paravertebral dulness is usually present; it is diagnostically important that this is associated with a free expansion of the lower pulmonary borders. If caries is present without dulness, that is, without an abscess, the aetiology of the bony process is more likely to be syphilis or malignant metastasis than tuberculosis. The kidneys account for a paravertebral dulness at the level of the 12th thoracic and the 1st and 2nd lumbar vertebrae. The percussion of the kidneys is best done in erect position and yields more definite results when the colon contains some gas, or when some air is introduced, if necessary.—*Welche perkutorisch feststellbaren Dämpfungen neben der Wirbelsäule haben eine diagnostische Bedeutung? V. Kollert, Wien. klin. Wchnschr., October 30, 1931, xliv, 1379.*—(*M. P.*)

Feeling of Resistance in Percussion.—Inspection, palpation, percussion, auscultation and roentgen examination should be performed by the same examiner. The finer details of both physical and roentgenological examination suffer by any other method. Special attention is given to the feeling of resistance during percussion and the examination of symmetrical areas of the chest.—*Röntgenstrahlen und physikalische Untersuchung der Lungen. Resistenzgefühl bei der Perkussion, A. Genersich, Ztschr. f. Tuberk., 1930, lvi, 218.*—(*H. J. C.*)

Amphoric Breathing in Pneumothorax.—The amphoric quality heard in the breath-sounds over a pneumothorax is due to an increased resonance in the normal vesicular respiratory murmur. In order for this type of breathing to occur, the collapse must be complete and the pleural surfaces must be entirely separated from one another.—*La teoria acustica e la semeiologia fisica del soffio anforico pneumotoracico, C. Minerbi, Tubercolosi, June, 1930, no. 6, 337.*—(*U. E. Z.*)

Pulmonary Tuberculosis without Usual Physical Signs.—Data are given in 503 cases of pulmonary tuberculosis in which the importance of roentgen-ray examination in the diagnosis is pointed out.—*A Study of 503 Cases of Pulmonary Tuberculosis with Indefinite or no Usual Abnormal Physical Signs, L. Brown, Am. J. Med. Sc., November, 1931, clxxxii, 700.*—(*W. I. W.*)

Diagnosis of Tuberculosis in General Practice.—A total of 2,677 patients who were diagnosed by general practitioners as having tuberculosis or influenza or some chronic pulmonary disease were reëxamined with particular emphasis on roentgenological studies. Of 392 patients diagnosed as pulmonary tuberculosis only 67 per cent had the disease. Apical catarrh was diagnosed 357 times; this diagnosis signified as a rule incipient tuberculosis. Only 27 per cent of these patients had pulmonary tuberculosis and only 19 per cent had active disease. In 29 patients tuberculosis was suspected and in 8 of them this diagnosis was confirmed. An equivocal diagnosis of pulmonary disease

was made 884 times, and it was not specified whether this diagnosis indicated a suspicion of tuberculosis. Thirty-three per cent of this group had pulmonary tuberculosis. Haemorrhage without an aetiological diagnosis was reported in 35 patients, 63 per cent of which had tuberculosis. In 113 patients dry pleurisy was diagnosed, but in only 14 per cent of these could tuberculosis be confirmed. In 605 patients bronchitis, emphysema or asthma was diagnosed, and 9 per cent of this group had pulmonary tuberculosis. A group of 241 patients had been ill with influenza for at least three weeks. Of these patients 73 had the disease not during an epidemic; 19 per cent of them had tuberculosis. Of 168 cases of influenza occurring during epidemics 8 per cent had pulmonary tuberculosis. *Summary:* Only 48 per cent of all patients diagnosed as pulmonary tuberculosis actually had the disease; of 1,053 cases with an equivocal diagnosis 35 per cent had pulmonary tuberculosis; and of 846 patients in whom tuberculosis was not suspected 9 per cent had tuberculosis. The necessity of roentgenological studies in all pulmonary patients is emphasized.—*Die Beteiligung der praktischen Ärzte am Auffinden der Tuberkulose, R. Hollmann, Klin. Wchnschr., December 19, 1931, x, 2359.* —(*M. P.*)

Differential Diagnosis of Pulmonary Tuberculosis.—The primary affection sets in, usually, in early childhood. It frequently involves the middle parts of the lungs and the tracheobronchial lymph nodes. The X-rays will reveal the enlarged lymph nodes. This stage is followed by one in which there is a dissemination by the blood and lymph, causing metastases in bones, kidneys, meninges, etc. This early phthisical (pulmonary) process is very apt to occur, not at the apex, but in the infraclavicular region. Early diagnosis in suspected tuberculosis necessitates careful physical examination of the apices, infraclavicular regions and axillae, and repeated X-ray and sputum examinations. Advanced cases are easily recognized because of infiltrations, cavities, fever and positive sputum. Some points are useful in differential diagnosis. In bronchitis, the inconstancy of the râles and the further course of the disease are important criteria. In bronchiectasis, the usual good health, freedom from fever, persistently negative sputum, and films after injection of lipiodol help to differentiate the disease from tuberculosis. Syphilitic processes uncomplicated by tuberculosis can be recognized with the help of the Wassermann test and results of specific therapy. Malignant tumors can best be recognized by X-ray and bronchoscopy. In Hodgkin's disease, the blood count is often useful. Other conditions which must be thought of in differential diagnosis are endocarditis lenta, typhoid fever, echinococcus disease, abscess and gangrene, pneumonoconiosis, actinomycosis and asthma.—*The Development of Pulmonary Tuberculosis and the Differential Diagnosis, O. Amrein, J. State Med., xxxix, May, 1931, 257.*—(*J. P. B.*)

Examination of Tuberculosis Contacts.—Case-finding is coming to be more and more important in tuberculosis work. In the present study, contacts were examined particularly from the standpoint of whether they might have fresh tuberculous pulmonary lesions without symptoms. A control group of normal, healthy students and nurses was studied. Among this latter control group of 1000 people, there was one case of early tuberculosis, although many of them showed calcified lymph nodes. Of the 400 contacts from a tuberculous environment, 11 cases of fresh pulmonary tuberculosis were encountered that were devoid of subjective symptoms. These were chiefly instances revealing fresh infiltrative lesions in the upper lobe or near the root. Such early infiltrations represent the beginning forms of tuberculosis and should be sought methodically among contacts.—*Die Bedeutung der Umgebungsuntersuchung für die fürsorgerische Erfassung der Frühformen der Erwachsenentuberkulose, J. Strasburger, Deutsche med. Wchnschr., July 17, 1931, lvii, 1234.* —(*H. S. W.*)

Roentgenography of Chest.—When one considers the stereoscopy of shadows produced by X-rays as distinct from those produced by rays within the range of the solar spectrum, it is found that a perspective of opacity is introduced and that there is an impression of solidity, which may increase or diminish the stereoscopic effect according to the conditions under which it occurs. This is due to the different degrees of translucency which the human tissues present to X-rays. It is customary to associate a dense image with proximity, while a faint image suggests either distance or the haziness of diplopia caused by location on a different plane. Thus it comes about that two tissues situated on the same visual plane will, by reason of the fact of their different translucency, produce shadows which suggest that they are definitely on different planes. This, quite as much as lateral movement of the object, accounts for stereoscopic distortion. Although one can locate the position of an image with extreme accuracy, there is nothing to pre-

vent the fusion of shadows to construct a solidity which has never existed. It is not intended to assert that the stereoscope is not a valuable instrument of precision, but for the clinician it is probably safer to depend upon conscious deduction from antero-posterior and lateral views rather than to risk an incorrect deduction from stereoscopic illusion.—*Stereoscopic and Postural Radiology of the Chest, L. B. Stott, Tubercle, September, 1931, xii, 539.*—(*M. E. P.*)

Roentgenography of Chest.—In the vast majority of cases, a single X-ray film is adequate to demonstrate the lesions of advanced pulmonary tuberculosis. However, the stereo-film is superior for the critical examination of the finer pulmonary structure which is essential in early tuberculosis, silicosis, localization of foreign bodies, hydatid cysts, artificial pneumothorax control and lipiodol injections.—*Stereoscopic and Postural Radiology of the Chest, P. W. Edwards, Tubercle, September, 1931, xii, 529.*—(*M. E. P.*)

Roentgenography of Chest.—The aim of stereoscopic radiography is to give an image which shows the relative position of structures, or to introduce the third dimension,—depth or solidity. It is particularly valuable in the orientation of adhesions in artificial pneumothorax, in lipiodol injections, in the localization of foreign bodies or cavities, and in the demonstration of variations in the size and shape of the aorta. Failure to obtain satisfactory stereoscopic films may be due to the vibrations of the tube on the horizontal bar after "shifting," lack of accuracy in placing the chest over the film, negligence in development of both films to the same density, movements of the patient, the unavoidable interval between the taking of the two films, or the uncontrollable movement occasioned by the heart.—*Radiostereoscopy of the Chest, J. B. Christopherson, Tubercle, September, 1931, xii, 532.*—(*M. E. P.*)

Roentgenology of Diaphragm.—As a result of pleuritic adhesions, the shape and contour of the diaphragm may be found to be more or less distorted. The existence of a diaphragmatic pleurisy will be recognized by the presence of an infiltration above the contour of the diaphragm; but if this happens to be located above the posterior half of the diaphragm it may escape recognition entirely when viewed in the antero-posterior direction alone. A change in the position of the diaphragm is one of the most frequent abnormalities encountered, and the correct interpretation is often quite difficult. When the elevation is due to intraäbdominal pressure, phrenic paralysis, atelectasis, or enlarged liver, the diaphragm is found elevated on the affected side, but the relation in the relative heights of the anterior or posterior attachments of the diaphragm remains the same. On the other hand, in case of subphrenic abscess the posterior portion of the diaphragm is found elevated and at times it may be found even higher than the anterior portion of the diaphragm. The posterior costophrenic angle is usually obliterated and the tissues above it show evidence of inflammatory changes.—*The Roentgenologic Study of the Diaphragm, S. Brown, J. Am. M. Ass., September 5, 1931, xcvii, 678.*—(*G. L. L.*)

Bronchoscopy in Diagnosis.—The present trend of the bronchoscopic art is to bring additional help to the internist in the investigation of the larynx, trachea and bronchial tree, and to assist him in diagnosing by means of bronchoscopy and pneumography many of the obscure abnormalities with which he is confronted and in which other physical signs and symptoms have proved to be inadequate. The surgeon can often obtain much helpful information from endoscopic examinations. In lung-abscess cases, the method of treatment is often dependent on the result of bronchoscopy. If there is abnormal drainage into the bronchi which can be successfully aspirated by suction, and if appropriate treatment can be instituted along bronchoscopic lines, a surgical operation is usually not necessary. On the other hand, if there is a large walled-off cavity with no communication into the bronchi, then surgical intervention is called for. In such cases coöperation between bronchoscopist and surgeon will ensure the best results. The indiscriminate use of bronchoscopy in frank tuberculosis cases is not advocated; as a rule, instrumentation of any kind is liable to do much harm. In chronic cases, however, if there is a question of some unrecognized or complicating condition, the decision may rest largely on the bronchoscopic examination. In some cases of profuse expectoration from large cavities, suction is of value in removing sputum from the trachea and from the posterior laryngeal wall. The removal may lessen the irritation and cough and help to prevent laryngeal complications. At times, also, endoscopy is necessary in the treatment of subglottic as well as laryngeal infiltrations and ulcerations when the cautery cannot be satisfactorily applied by indirect procedures. Many patients are sent to sanatoria with a history of repeated attacks of haemoptysis. In most of these cases tuberculosis is naturally

suspected, but on bronchoscopic examination in some of them a local cause can be found for the bleeding and all symptoms can be relieved by endoscopic treatment.—*Bronchoscopy as an Aid in the Diagnosis of Obscure Pulmonary Disorders, E. A. Looper, J. Am. M. Ass., October 31, 1931, xcvii, 1287,* (*G. L. L.*)

Bronchoscopy in Tuberculosis.—Bronchoscopy is not indicated in the treatment of uncomplicated pulmonary tuberculosis. Its value in tuberculosis is limited largely to diagnosis, although certain cases may be benefited by treatment. From a bronchoscopic point of view, cases should be grouped into two classes, namely, proved cases of pulmonary tuberculosis that develop certain symptoms or signs requiring investigation or treatment and cases presenting obscure pulmonary signs suggesting tuberculosis, but in which the diagnosis cannot be established by the ordinary methods of examination. Absolute contraindications to bronchoscopy in pulmonary tuberculosis are rare. Pneumothorax, marked haemoptysis, extensive pulmonary involvement and laryngeal involvement could be considered as contraindications. One must consider the importance of the indications. In a large group of tuberculosis patients who have been examined bronchoscopically, no ill effects were noted from the bronchoscopy itself.—*Is Bronchoscopy Indicated in Tuberculosis? L. H. Clerf, J. Am. M. Ass., July 11, 1931, xcvii, 87.*—(*G. L. L.*)

Bronchography in Differential Diagnosis.—By means of bronchography two groups of diseases were differentiated: cases in which roentgenological changes were almost completely absent and cases with marked contraction and dense connective-tissue shadows. If tubercle bacilli are absent from the sputum while undoubted cavity symptoms are present the indication would be toward bronchiectasis-formation which can be proved by means of bronchographs.—*Die Bronchographie als Methode differentialer Diagnostik von tuberkulösen Kavernen und Bronchiektasien, A. J. Katzmann and J. A. Nowikow, Ztschr. f. Tuberk., 1930, lix, 44.*—(*H. J. C.*)

Injection of Lipiodol.—A technique is described for the injection of lipiodol through the cricothyroid membrane into the larynx.—*A New Method for the Injection of Lipiodol, E. Fletcher, Brit. M. J., November 7, 1931, no. 3696, 846.*—(*M. E. P.*)

Injection of Lipiodol.—A technique is described for the injection of lipiodol into the lungs by the intranasal route, using a small catheter.—*A Simple Technique for Introducing Lipiodol into the Lungs, P. Franklin and A. Orley, Brit. M. J., November 7, 1931, no. 3696, 847.*—(*M. E. P.*)

Method of Instilling Iodized Oil into Lungs.—A head mirror may be so attached to the syringe used for injecting lipiodol or other fluids in the lungs as to allow the manipulator to see exactly where the oil goes. Illustrations and a description of the apparatus are given.—*A New and Ideal Method for Injections of Iodized Oils and Other Fluids in the Lungs, A. Josefson, Am. J. Surg., April, 1931, n.s. xii, 143.*—(*H. S. W.*)

Intralaryngeal Injection of Lipiodol.—The use of special apparatus is described. The laryngeal mirror used carries a light, thus eliminating the use of a head-mirror. Compressed air, or oxygen, supplied from a portable cylinder, is used to apply the spray of 5 per cent solution of cocaine, not more than 25 cc. of the solution being used. It is also used to inject the lipiodol by means of a special syringe. Preliminary postural drainage of the lungs is recommended. Only one lung should be injected at a sitting, and not more than 20 cc. of lipiodol should be used at the first injection. Flooding of the larynx should be avoided. Roentgenograms should be made in the erect and recumbent positions. Forty-three injections were given in a series of 32 cases, of which 15 were men and 17 were women. There were 3 failures, two of which were due to nervousness of the patient, and the third to incomplete anaesthesia.—*The Technique of Intralaryngeal Injection of Lipiodol, with Description of Special Apparatus, W. J. Fenton, Lancet, August 1, 1931, ccxxi, 230.*—(*R. M. F.*)

Complications Following Lipiodol.—Lipiodol fillings were performed in 14 cases, in 8 of which occurred complications which are described in detail. In 6 of these cases pulmonary tuberculosis was present. Two of the cases had iodism (rhinitis and swelling of the laryngeal mucous membranes), one haemoptysis and glomerular nephritis, two exudate, one febrile reaction and progression of the tuberculosis, and one dyspnoea. In one case lipiodol was forced into the healthy lung by coughing,—an undesirable complication even though no distinct harm was noted.—*Über Komplikationen bei intratrachealer Lipiodolfüllung, S. Erlandsson, Beitr. z. Klin. d. Tuberk., 1930, lxxvi, 105.*—(*H. J. C.*)

Precavity Annular Shadows.—The author describes a case of precavernous ring-

formation (in the Alexander sense) in a young girl. The hen-egg-sized ring shadow indicated a circle of demarcation which later resorbed and finally led to the formation and limitation of a much smaller genuine cavity. A coincident left-sided pneumothorax appeared as a contralateral pneumothorax to influence the process favorably. — *Beitrag zur Frage des präkavernösen Ringschattens und der spontanen Kavernenheilung, H. H. Knüsli, Ztschr. f. Tuberk., 1930, lvii, 228.*—(*H. J. C.*)

X-Ray Terminology.—It is often difficult to reconstruct the pathological description of pulmonary disease from the perusal of the roentgenologist's report, although some of the designations, such as annular shadow, interlobar bands, pulmonary markings, etc., are familiar and well chosen. Some observers like to use terms which have been taken from the description of clouds; for instance, "stratus" as indicating the structureless shadow or haziness such as is seen in pleurisy. The term "cumulus" is applied to areas or shadows that are circular, oval, polygonal, clover-like or ball-like. These are individual shadows, and may be of small, medium or large size. "Cirroid" designates *band-like, near-parallel* or *net-work*, individual shadows. These shadows are intermixed as for instance; there may be a "stratus" plus a "cumulus" appearance, and so on. The intensity of the shadows is described by the terms "hard" and "soft."—*Die Beschreibung des röntgenologischen Lungenbefundes, W. W. Siebert, Deutsche med. Wchnschr., July 31, 1931, lvii, 1315.*—(*H. S. W.*)

Bacteriological Diagnosis of Tuberculosis.—A comparison was made of the results obtained with Herrold egg-yolk-agar medium and with inoculation of guinea pigs. The medium is prepared by adding one egg yolk to 200 cc. of 1.5 per cent agar at 60°C. The sediment from uncontaminated material was cultured and inoculated without treatment. Contaminated material was treated with equal parts of 3 per cent hydrochloric acid and incubated at 34°C. for one half an hour. The supernatant fluid was then decanted and a sterile physiological solution of sodium chloride added to the sediment, if necessary to facilitate its handling. The guinea pigs weighed approximately 250 gm. and six weeks were allowed to elapse before autopsies were done. The results of cultures and inoculations agreed in 93 per cent of 130 cases; in 5 of 9 cases in which results disagreed, the Herrold cultures were found the more reliable. Thirty-six strains of tubercle bacilli were recovered on the Herrold medium in an average of 12.2 days.—*The Diagnosis of Tuberculosis. A Comparison of the Results Obtained with Herrold Egg Yolk Agar Medium and with Inoculation of Guinea Pigs, C. I. Woolsey, J. Infec. Dis., August, 1931, xlix, 177.*—(*F. G. P.*)

Isolation of Tubercle Bacilli.—Since the author's method for the isolation of tubercle bacilli from contaminated material was published in 1926, several improvements have been added. It is now recommended to add to the egg medium 2 per cent of haematin. Haematin solution or old haemoglobin solution stimulates the growth of tubercle bacilli considerably. In order to reduce contaminations, which were found in about 6 per cent of all tubes, the addition of malachite-green in the proportion of 1:4,000 is recommended. On this egg-haematin-malachite-green medium, less than 2 per cent of the tubes showed contaminations. The optimum concentration of glycerol was found to be 2.5 per cent. Coagulation and sterilization of the medium is done at 83°C. In order to avoid uneven surfaces which are caused by air-bubbles, the medium should be placed in the refrigerator for half an hour before coagulation. During the year 1930, 211 positive cultures were obtained; this represented 59.2 per cent more positive results than by bacterioscopic studies. On the medium described, human and bovine bacilli can be differentiated by their characteristic colony formations. For this purpose a large colony approximately 1.5 cm. in diameter should be planted slightly above the water of condensation. After 2 to 3 weeks the colonies are sufficiently characteristic to permit differentiation of types. The human type produces a dry, whitish-yellow and hard colony with irregular elevations. The bovine type produces a flat grayish-white, moist and glistening colony which has the consistence of rubber. Out of 253 strains typed by this method, 2.7 per cent proved to be bovine strains. The colony-formation of *BCG* shows more the characteristics of the human type. It resembles most the colonies of the smegma bacillus.—*Der Z-Einährboden zur Kultur des Tuberkelbacillus. Die Typendifferenzierung auf Z-Einährboden, J. Hohn, Klin. Wchnschr., December 5, 1931, x, 2251.*—(*M. P.*)

Tubercle Bacilli in Blood.—The recent studies of Löwenstein on the occurrence of tubercle bacilli in the peripheral blood have opened a number of new questions. It should be established whether demonstration

by culture method or by animal inoculation is more reliable. Does the demonstration of tubercle bacilli in the blood prove in every case a true bacillaemia? Is the virulence of tubercle bacilli in the blood the same as that of bacilli in the foci? Are antibodies demonstrable in bacilliferous blood? What is the type of tubercle bacilli which occur in the blood? In order to answer all these questions it is necesary to use quantitative methods and to compare in a quantitative way the results of pure cultures and animal inoculations. If fewer positive results are obtained by animal inoculation than by cultural methods this may be due either to a relative avirulence of the bacilli or to the presence of bactericidal antibodies in the blood. Since Löwenstein's method yields a large amount of sediment it was attempted to improve the method. In agreement with Löwenstein it is assumed that the haemoglobin impairs the growth of tubercle bacilli. It is therefore necessary to use a haemolyzing agent. The citrated blood is centrifugated and the red cells are repeatedly washed with salt solution to remove the plasma. A 1:500 solution of saponin is added to the sediment in the double amount of the original volume of blood. This produces a rapid haemolysis, provided that the plasma has been completely removed. With equal parts of the sediment obtained by this method, cultures and guinea-pig inoculations are done.—*Der Tuberkelbazillennachweis aus dem Blut durch Tierversuch und im Kulturverfahren, B. Busson, Wien. klin. Wchnschr., November 13, 1931, xliv, 1431.*—(*M. P.*)

Cultivation of Tubercle Bacilli from Blood.—The author attempted to grow tubercle bacilli from the blood by Löwenstein's method in various types of tuberculosis, including surgical forms. Venous blood was collected in 10 per cent sodium-citrate solution, and the supernatant plasma removed after sedimentation, while the sediment was treated with 3 per cent acetic acid and washed with sterile water. The sediment was then planted on Löwenstein's egg medium, prepared without peptone or milk but containing asparagin and congo-red or malachite-green. This resulted in 77 cultures from cases of bone and joint tuberculosis in adults and children, and among 31 cases 40 per cent were positive. Cultures were easily obtained from severe and final-stage cases of phthisis. In these cases a bacillaemia with a relative absence of symptoms is considered as a result of "dysergie." The determination of tubercle bacilli in the circulating blood is considered of more significance as a symptom of activity than the tuberculin reaction.—*Ergebnisse der Züchtung von Tuberkelbacillen aus dem Blut nach Löwenstein, A. Fischer, Ztschr. f. Tuberk., 1930, lviii, 331.*—(*H. J. C.*)

Blood Cultures in Tuberculosis.—The growth of tubercle bacilli on artificial media has always presented difficulties. Although cultures have been obtained from sputum and caseous material, bacilli have been grown only rarely from the blood. Recently, however, Löwenstein and Reitter have successfully cultivated tubercle bacilli from the blood. In this study Löwenstein egg-meat-broth medium was used. The medium was first tested with sputum and excellent growths were obtained. The blood from 11 patients was then cultured. Of these one gave a positive result.—*Blood Culture in Tuberculosis, H. M. Schwabacher, Lancet, May 23, 1931, ccxx, 1130.*—(*F. G. P.*)

Urea as Enriching Medium in Isolation of Tubercle Bacilli.—Urea possesses definite advantages over antiformin as an enriching medium. Urea has a slighter detrimental influence on tubercle bacilli than antiformin and the bacilli stain more distinctly after urea treatment. Urea does not destroy spore-formers, and is less detrimental to the development of tubercle bacilli than is sulphuric acid. Tubercle bacilli, treated with urea without washing, grow best on glycerine-potato, and this has advantages over the Hohn procedure in that the latter requires a more expensive material (egg). One part of sputum is treated with two to four parts of a 40 to 45 per cent saturated urea solution, and this is permitted to remain for one-half to one hour. Before making smears the mixture is diluted with three to four parts of water.—*Die Brauchbarkeit des Harnstoffverfahrens nach Dold zur Anreichung von Tuberkelbacillen für den mikroskopischen und kulturellen Nachweis, R. Stodtmeister, Centralbl. f. Bakt., I, Orig., 1930, cxvii, 218.*—(*H. J. C.*)

Hohn's Culture Method.—The Hohn culture method for tubercle bacilli was used in 561 examinations, including spinal fluid, puncture fluids, sputum and urine. On account of the marked contaminations in stools this method was little suited for that type of examination. Compared with animal tests a difference was noted in 6 cases; being positive 5 times by animal test while the culture was negative, and being negative once by animal test with a positive culture.—*Erfahrungen mit dem Tuberkelbacillen-Kulturverfahren nach Hohn, Irene v. Trossel, Beitr. z. Klin. d. Tuberk., 1930, lxxiii, 619.*—(*H. J. C.*)

Tubercle Bacilli in Gastric Contents.—Determination as to whether pulmonary tuberculosis is "open" or "closed" depends upon the microscopic examination of the secretions with the help of concentration, cultures and guinea-pig inoculation. Inoculation with the sediment of gastric contents of children, 4 months to 4½ years of age, who had epituberculosis revealed tubercle bacilli quite regularly,—in fact, in 28 out of 30 instances. In children from 2 to 8 years of age with interlobar and mediastinal pleurisy, animal inoculation was positive in only one out of 7 instances. In 24 cases with increased root shadows, 3 were positive. Of 3 cases with tuberculous cervical adenitis, one was positive. Of 6 cases of orthopaedic tuberculosis, 2 were positive. Of 7 cases with meningitis, all were positive. The supposition has always been that tubercle bacilli in the gastric contents come from swallowed sputum, but the possibility of other sources must be kept in mind, such as the excretion of tubercle bacilli with the bile, which may regurgitate into the stomach. In 12 cases the duodenal and gastric contents were simultaneously examined. In all instances the stomach contents or both were positive. In a few cases the contents of the gall-bladder were sometimes positive and sometimes negative. In a number of older children with infraclavicular or benign cirrhotic processes and in apparent good health, bacilli were found in the gastric contents. This test is also important in patients with pneumothorax. The pulmonary process may not be considered healed until at least three specimens of gastric contents are negative. Children with positive gastric contents must be considered as bacilli-shedders and should receive appropriate measures of isolation and treatment.—*Neue Forschungen über die Diagnose der Lungentuberkulose durch Bazillennachweis, H. Opitz, Deutsche med. Wchnschr., November 21, 1930, lvi, 1995.*—(*H. S. W.*)

Epidermal Tuberculin Reaction.—The technique of the epidermal reaction is as follows: Pieces of linen, about 1 cm. square, are soaked with 1, 10, or 25 per cent tuberculin dilution and are applied to the normal, nonscarified skin and held in place by adhesive tape. After 24 hours the linen is removed and the skin is cleansed with physiological salt solution. A positive reaction is characterized by eczema-like changes, such as reddening, infiltration with the formation of nodules, vesicles or pustules. The reaction disappears completely within 4 to 10 days. One hundred and twenty patients were tested with this reaction and simultaneously with a Pirquet test and with the intracutaneous injection of Old Tuberculin, 1:10,000. All reacted to the last two tests. The group contained 15 patients with skin tuberculosis, all of which gave a positive epidermal reaction to 1 per cent Old Tuberculin. In all the other cases who had no tuberculous skin lesions the reaction was negative. It appears therefore that with this epidermal application of tuberculin skin tuberculosis can be diagnosed and differentiated from other skin lesions regardless of the presence of other tuberculous foci. It must be concluded that in the presence of specific skin lesions a specific hypersensitiveness is conferred upon the skin distant from the specific foci.—*Über eine epicutane Tuberkulinreaktion bei Hauttuberkulose, E. Nathan and P. Kallos, Klin. Wchnschr., December 26, 1931, x, 2392.*—(*M. P.*)

Peripheral and Perifocal Blood-Pictures in Pulmonary Tuberculosis.—Examination of the blood in the area surrounding a site of Pirquet reaction gave a valuable and simple method, especially for prognosis. Variations in the perifocal and the peripheral blood-picture were noted. While in the peripheral blood, healing was associated with a decrease in the mature and immature neutrophiles, and increase of monocytes and lymphocytes and lymphocytosis, in the perifocal blood-picture there was an increase in the lymphocytes with leucopoenia. The monocyte counts changed late in the course of healing; there was, first, monopenia, then normal values, and finally a monocytosis. While in the peripheral blood there was a shift in the cell groups from a neutrophilia to a monocytosis and finally lymphocytosis, in the perifocal blood there was a definite shift only from a neutrophilia to a lymphocytosis, which was then followed by a monocytosis.—*Weitere Untersuchungen über das periphere und perifokale Blutbild bei Lungentuberkulösen, T. Sternberg, Beitr. z. Klin. d. Tuberk., 1930, lxxiv, 554.*—(*H. J. C.*)

Serology of Tuberculosis.—The general conclusions which are discussed in this paper are based on complement-fixation tests, using an antigen prepared by Witebsky, Klingenstein and Kuhn. No figures are reported to indicate the number of tests done nor the percentage of positive reactions under certain conditions. The reaction is claimed to be very specific. No one disease yielded a remarkable percentage of positive reactions with the exception of tuberculosis. There is no relation between complement fixation and the nonspecific lability of the serum. Tubercle bacilli and diphtheria

bacilli have in common a part of their antigenic nature. Among the control cases that were tested there was a number of positive reactions in the absence of clinical signs of tuberculosis, but it remains undecided whether this means a shortcoming of the serological test or of the clinical examination. Serial examination, particularly in pneumothorax cases, established the fact that antibodies persist long after all clinical signs of the disease have disappeared. At the present stage of our knowledge it must not be assumed that positive complement fixation *per se* indicates clinical tuberculosis. Antibodies and tuberculin skin tests do not run parallel. While the latter is always positive when calcified foci are roentgenologically demonstrable, the former is usually negative in such cases. The result of complement-fixation tests has no prognostic significance. In certain clinical forms of tuberculosis complement fixation is regularly negative. Pulmonary tuberculosis yields a much higher percentage of positive fixations than extrapulmonary tuberculosis, and positive tests are particularly rare in skin tuberculosis. The majority of reactions in children during the period of primary infection is negative. It seems that in the presence of pulmonary tuberculosis negative reactions are prone to occur when the parenchymal lesion is associated with caseation of the mediastinal lymph nodes, or with extrapulmonary haematogenous foci. It appears that all cases belonging to Ranke's first and second stage are usually negative.—*Zur klinischen Bewertung der spezifischen Blutveränderung bei Tuberkulose, R. Klingenstein, Klin. Wchnschr., December 19, 1931, x, 2330.*—(*M. P.*)

Clinical Use of Besredka's Antigen.—Besredka's antigen was given by intracutaneous and subcutaneous injections, with careful dosage, and was well tolerated. A favorable result upon the diseased process was noticed in the majority of cases. Regularly, however, after a number of weeks there developed sterile abscesses at the injection site. With careful dosage the action of the antigen appears to be similar to that of Old Tuberculin.—*Vorläufige Mitteilung über klinische Anwendung von Antigen Besredka, N. Westenrijk, Beitr. z. Klin. d. Tuberk., 1930, lxxiv, 642.*—(*H. J. C.*)

Neuberg-Klopstock Complement-Fixation Reaction.—The author used the complement-fixation reaction of Neuberg-Klopstock on 340 cases and as antigen used a killed and dried tubercle-bacillus suspension in sodium benzoate in a dilution of 1:10. A markedly positive reaction was found only in the presence of active tuberculous processes, while weakly positive results were obtained in 13 to 17 per cent of inactive or nontuberculous individuals.—*Klinische Erfahrungen mit der Komplementbindungsreaktion nach Neuberg-Klopstock, R. Levy, Ztschr. f. Tuberk., 1930, lvii, 163.*—(*H. J. C.*)

Complement Fixation and Serum Lability.—Comparative results of complement fixation and the Daranyi serum-lability test were studied for their clinical value. In pneumothorax cases clinical occurred earlier than the serological inactivity. The latter was of value in the healing process. In 25 early fibrous cases without pneumothorax there was an increased lability reaction in 17. Especially in these cases differential diagnosis is difficult. Complement fixation was positive in 40–45 per cent of them. In all of 44 exudative cases the lability reaction was increased, and 70 per cent of them gave a positive complement fixation. In progressive cases a high refraction and increased lability indicate a favorable prognosis, while a diminished refraction with prolonged increased lability is prognostically unfavorable. The lability test gives better results than complement fixation and is simpler.—*Über die Brauchbarkeit der Komplementbindungs—und der Serumlabilitätsreaktion bei Tuberkulose, G. Ivanovics, Beitr. z. Klin. d. Tuberk., 1930, lxxv, 657.*—(*H. J. C.*)

Matefy Reaction.—Matefy's test was done on 265 patients and was compared with the determination of urochromogen in the urine and with the sedimentation reaction. The results indicate that Matefy's reaction is not specific for tuberculosis, that it is positive in all patients in which tissue destruction is occurring, and that it is therefore diagnostically insignificant. To a certain extent the reaction is an indication of the activity of the process, and in this regard it helps to establish the differential diagnosis between diseases of organic and nervous origin. Matefy's reaction is less sensitive than the determination of urochromogen and it follows the clinical course of the disease less exactly than the latter. The parallelism between Matefy's reaction and the red cell sedimentation is slight.—*Die klinische Bedeutung der Reaktion von Matefy, S. P. Solomin, Wien. klin. Wchnschr., November 6, 1931, xliv, 1401.*—(*M. P.*)

Red-Cell Sedimentation Modified by Tuberculin.—The author studied the sedimentation reaction in tuberculous individuals, both with and without the addition of Old Tuberculin, the latter being added in

0.07-cc. amounts and readings being made at one-half, one, two, four, eight and 24 hours, the results being plotted in curve-form. Generally the sedimentation rate was more rapid after the addition of Old Tuberculin. Two conspicuous results were noted: in one the course of both curves ran parallel and in the second, although initially the same, the Old Tuberculin sedimentation proceeded more slowly, this being followed at shorter or longer intervals by a more rapid sedimentation. The author considers a definitely active tuberculosis to be present when the two curves cross twice, and the greater the space between this crossing the more severe the disease. A set of curves without crossing would be against active tuberculosis being present.—*Der Verlauf der Blutsenkungsreaktionskurven ohne und mit Zusatz von Alttuberkulin für die Diagnose und Prognose der Lungentuberkulose. Vorl. Mitt. H. Glaser, Ztschr. f. Tuberk., 1930, lvi, 287.*—(*H. J. C.*)

Micro-Sedimentation Reaction in Experimental Tuberculosis.—Geschke described the sedimentation reaction as a means of following tuberculous infection in guinea pigs. The author found it necessary to simplify this technique and therefore used a microsedimentation reaction (Langer and Schmidt). The normal values on 9 healthy rabbits showed very little difference as between the macrosedimentation and microsedimentation methods. At eight-day intervals for a period of 4 months, 6 rabbits infected with bovine and 6 with human tubercle bacilli were studied, using both reactions. In the "bovine" animals there occurred a hastening of the sedimentation reaction within a few days ot the appearance of palpable lymph nodes and this gradually increased, except for a slowing in three of the animals shortly before death. In the animals infected with human bacilli the reaction was not quite as marked. It occurred 8 to 14 days after appearance of palpable lymph nodes. In 2 of the animals infected with human bacilli, in which the infected lymph nodes were extirpated, there was a hastening of the reaction for about 3 months, and then a final return to normal, indicating healing. Tuberculin injections shortly after extirpation did not influence the sedimentation reaction.—*Inwieweit lässt sich die Mikro-Senkungsreaktion im Verlauf der tuberkulösen Infektion des Kaninchens verwenden? G. Lindemann, Ztschr. f. Tuberk., 1930, lviii, 184.*—(*H. J. C.*)

Cholesterol Mirror of Blood in Pulmonary Tuberculosis.—In 200 determinations on 100 cases of tuberculosis of various stages and forms, mild and inactive processes gave cholesterin values within normal limits, ranging from 122 to 160 mgm. per cent in the blood, while in severe toxic cases there was a decided diminution in the cholesterol mirror to values as low as 82 mgm. per cent. There were also seasonal variations, with higher values in summer than in winter.—*Untersuchungen des Cholesterinspiegels des Blutes und des Blutserums bei der Lungentuberkulose nach dem Verfahren von Alcel und Autenrieth-Funk, F. Warnecke, Ztschr. f. Tuberk., 1930, lvi, 137.*—(*H. J. C.*)

Tuberculosis of Larynx.—Tuberculosis of the larynx is so frequent and so fatal a complication of tuberculosis that any suggestions for preventing its occurrence, or for securing treatment in its early stages, should be given consideration, even if there is no proof that they will necessarily prove effective in all cases. The following measures should be taken: rest in a sanatorium; the restriction of the voice to a whisper over a period of some months; complete silence for a similar period; the elimination of sepsis in the upper air-passages; the prevention of cough. The application of the galvanocautery to a laryngeal lesion should not be made until this has been quiescent for some months. It has the effect of replacing tuberculous granulations by scar-tissue. The action of radium is similar to that of the galvanocautery. It is more thorough than the galvanocautery because it is applied from the outside and leaves no part unstimulated. It is less drastic than the galvanocautery because it produces no fulminant local lesion and needs no local anaesthesia. But, like the galvanocautery, it is a weapon which should be used only by a specialist who has watched the progress of the case and feels certain in his own mind that the condition is quiescent.—*The Prophylaxis of Tuberculosis of the Larynx, H. M. Wharry, Brit. M. J., July 18, 1931, no. 3680, 98.*—(*M. E. P.*)

Exacerbation of Laryngeal Tuberculosis by Phrenicectomy.—Right-sided phrenic exairesis was done for progressive pulmonary tuberculosis with a slight laryngeal lesion. Immediately after the operation there followed an explosive laryngeal perichondritis which resulted in death within a few weeks. A relationship between exairesis and progression of laryngeal tuberculosis is a rare one, and this case is probably the first noted in the literature. Laryngeal findings seem to be an additional risk in exairesis.—*Komplikation nach Phren-*

icoexhairese, K. Zehner, Beitr. z. Klin. d. Tuberk., 1930, lxxvi, 227.—(*H. J. C.*)

Roentgenological Forms of Pleurisy.—The forms of circumscribed pleural shadows differentiated by the authors are disc or flat shadows, annular shadows, and larger shadow complexes of irregular content and, finally, linear shadows. Dense, circumscribed pleural shadows can be confused with fresh infiltrations or tumor metastases. Stereoscopic pictures, however, assist in determining the aetiology. An examination of a large material revealed only once an annular shadow due to pleural adhesions. As a rule annular shadows are to be regarded as cavities.—*Beitrag zur Kenntnis der röntgenologischen Erscheinungsformen der Pleuritis, A. Pies, Beitr. z. Klin. d. Tuberk., 1930, lxxiii, 799.*—(*H. J. C.*)

Rupture of Tuberculous Lymph Node into Aorta.—Endogenous lymph-node reinfection may occur in an exacerbation of tuberculous infection in the lymph-node drainage region of healed primary affects, and at the age of about 45 years play a definite rôle in the development of phthisis of the aged. Rupture of a caseated lymph-node into the aorta, at its junction with the subclavian artery, occurred in a 55-year-old woman with miliary tuberculosis, and fatal encephalomalacia followed a cerebral embolism.—*Ein Fall von Endogener lymphoglandulärer Reinfektion mit Einbruch in die Aorta und miliarer Tuberkulose. Tod durch Gehirnembolie, L. Bubak, Ztschr. f. Tuberk., 1930, lviii, 241.*—(*H. J. C.*)

Tuberculosis of Tongue.—In Switzerland tuberculosis of the tongue is rare. During the past ten years a total of only 26 cases was found. Diagnosis is not difficult, but test excision should be resorted to. The curve of frequency showed three maxima, at 28, 36 and 50 years. The left side is most frequently afflicted, and the condition is six times as frequent in men as in women. The prognosis following treatment (excision, cauterization, etc.) depends upon the general condition and the age. Infection is believed to result most frequently along blood- and lymph-channels, while primary exogenous infection is considered rare.—*Die Tuberkulose der Zunge. (Schweizerische Sammelstatistik aus den letzten 10 Jahren.), G. Nicholas, Deutsche Ztschr. Chir., 1930, ccxxvi, 46.*—(*H. J. C.*)

Roentgenology of Colon.—Roentgenologicoanatomical studies on the colons of 300 male and 300 female patients with pulmonary tuberculosis are reported. The usual location of the caecum in both sexes was on the *linea terminalis*; it was situated in the lesser pelvis twice as frequently in females as in males. The ascending colon was of average length in about 55 per cent of the males and in about 59 per cent of the females. It was longer in about 20 per cent of the males and in 26 per cent of the females, and it was shorter in 25 per cent of the males and in about 15 per cent of the females. The hepatic flexure formed an approximate right angle in only about 15 per cent of the males and in 8 per cent of the females. In the others there was an acute angle, and the first portion of the transverse colon lay parallel with the ascending colon in about 34 per cent of the males and in about 25 per cent of the females for half of the length or less of the ascending colon, and in about 25 per cent of the males and in about 38 per cent of the females for more than half of the length. The usual location of the hepatic flexure in both sexes was at the level of the fourth lumbar vertebra. Adhesions between the ascending and the transverse colons were inferred in about 50 per cent of the males and in about 45 per cent of the females. The most dependent portion of the transverse colon reached below the level of the promontory in 68 per cent of the males and in about 91 per cent of the females. The usual position of the lowest point of the greater curvature of the stomach in both sexes was at the level of the fifth lumbar vertebra; as a rule it was found to reach lower in females than in males by the height of the body of one vertebra. Nonfusion of the layers of the great omentum, (absence of the gastrocolic ligament) was inferred about twice as frequently in females as in males. The usual position of the splenic flexure in both sexes was at the level of the third lumbar vertebra. Adhesions between the transverse and the descending colons were inferred in about 27 per cent of the males and in about 38 per cent of the females. The data gathered suggested no roentgenologicoanatomical features peculiar to tuberculous individuals, nor was the colon different roentgenologically in patients in whom intestinal tuberculosis had complicated at one time or another the pulmonary lesion from those in whom it did not.—*Roentgen-Anatomic Studies of the Colon in Six Hundred Patients with Pulmonary Tuberculosis, H. L. Sampson and B. Halpert, Am. J. Roentgenol. & Rad. Ther., November, 1931, xxvi, 704.*—(*W. I. W.*)

Hyperplastic Tuberculosis of Ileum.—Chronic hyperplastic tuberculosis of the ileum is considered to be a primary lesion because of the absence of other foci of

disease and of the frequent healing which follows extirpation. The area of disease is composed of specific granulation tissue, without caseation, which is situated chiefly in the submucosa. It may ulcerate. The disease leads to gradual constriction of the bowel. Grossly, the thickened bowel resembles carcinoma. The regional lymph nodes are enlarged. It occurs usually between the ages of 20 and 40, although to date only 10 cases have been reported. Symptoms are relatively nonspecific. They are those of chronic intestinal stenosis. There is cachexia, wasting, anorexia, colic, rumbling, occasional vomiting, visible peristalsis, rarely blood in the stools, a firm, hard, nodular, usually cylindric tumor is felt most frequently in the ileocecal region. This is not painful; does not move with respiration, but may be moved by the fingers; there is little or no fever unless an abscess is present. Excision in the case here reported led to apparently complete recovery.—*Chronic Hyperplastic Tuberculosis of the Ileum, J. J. Cunningham and H. Sneierson, Am. J. Surg., April, 1931, n.s. xii, 131.*—(*H. S. W.*)

Enteritis and Pulmonary Tuberculosis.—Many cases of pulmonary tuberculosis suffer from a catarrhal enteritis which is not tuberculous, and its early recognition and prompt treatment will often cause great improvement in the pulmonary lesion. Poor assimilation of albuminous material is given as a possible cause, and in such cases protein foods must be avoided.—*Tubercolosi polmonare e catarro intestinale, Pedaja and Kalmar, Tubercolosi, July, 1930, no. 7, 289.*—(*U. E. Z.*)

Miliary Tuberculosis of Peritoneum.—An emergency laparotomy was done for acute intestinal obstruction. Many adhesions were found and the parietal and visceral peritoneum was covered with miliary tubercles. The patient made an uneventful recovery and has been well for the past two years following operation.—*Forme solitarie di tubercolosi miliare diffusa del peritoneo, E. Jaccarelli, Tubercolosi, April, 1930, no. 4, 165.*—(*U. E. Z.*)

Pneumoperitoneum.—Forty-four cases of tuberculous enterocolitis treated by pneumoperitoneum are reported. The therapeutic effect of this procedure is considered to be due to the direct chemical influence of oxygen, the increased intraäbdominal pressure and the hyperaemia of the peritoneum and intestinal serosa. Symptomatic relief was noted in 31 (70.4 per cent) of this group. Complete relief was seen in 14 (31.8 per cent), partial relief from all intestinal symptoms in 10 (22.7 per cent); diarrhoea ceased while other symptoms persisted in 5 (11.3 per cent); diarrhoea persisted while other symptoms ceased in 2 (4.7 per cent). The duration of symptomatic relief varied from a few days to 2 years. There was no relief in 13, or 29.6 per cent.—*Pneumoperitoneum in the Treatment of Tuberculous Enterocolitis, A. L. Banyai, Am. J. Med. Sc., September, 1931, clxxxii, 332.*—(*W. I. W.*)

Roentgenology of Spleen in Experimental Tuberculosis.—In order to study the course of tuberculosis in the spleen in living animals the author used metal plates so that the organ could be visualized roentgenographically. The structure of the spleen was modified by the metal plates only in the immediate vicinity, in the form of encapsulation by reparative inflammation. The behavior of the spleen following the intraperitoneal introduction of tuberculin, various vaccines, milk, distilled water, salt solution, and one per cent sugar solution was studied. In positive cases the increase in the spleen occurred in about 12 hours and reached a maximum within 36 hours. By the third day the spleen became smaller and only occasionally did this persist. The injection of the same materials in healthy animals never resulted in an increased size of the spleen. Histologically, the splenic findings were not always uniform in focal reactions, but the roentgenological examinations revealed a sensitiveness of the tuberculous organism not only for the derivatives of the tubercle bacillus but also for heterologous vaccines and other proteins.—*Röntgenologische Untersuchungen über die Grossenveränderungen der Milz bei der experimentellen Tuberkulose des Meerschweinchens, S. Lorand, Ztschr. f. Tuberk., 1930, lvi, 347.*—(*H. J. C.*)

Tuberculosis of Bones and Joints.—Tuberculosis of bones and joints is always a secondary manifestation. The primary infection, healed or not, is most frequently in the lung and its draining lymph nodes. The skeletal system is usually infected by way of the blood-stream, less frequently by way of the lymph-channels. Whether a direct infection through the skin is possible or not is still undecided. The infection may occur through direct contact from a diseased organ. The localization is most frequently in the bodies of the vertebrae and in the metaepiphyses of the long bones, that is, in the best vascularized region. One may differentiate a benign granulating tuberculosis and a prognostically much more serious form, such as caseating tuberculosis. The former destroys the bony trabeculae but may

heal by fibrosis. Since the trabeculae are destroyed early in this development this type of disease is demonstrable by X-ray in its early stages. Caseating osteitis, frequently producing wedge-shaped lesions, leads to necrosis of the trabeculae, but does not remove the lime salts; therefore its roentgenological demonstrability is late in the disease. Tuberculosis of the joints begins either in the synovial membrane or in the bony parts of the joint. Skeletal tuberculosis is rare in the first year of life and becomes more frequent from the third year on. The most frequent localization is in the bodies of the vertebrae (spondylitis) and in the hip joint. The order of the frequency of other localizations is as follows: knee joint, foot, upper extremities. In the diagnosis of tuberculous spondylitis the history and symptomatology, as revealed by physical examination and by parental observation, are of greatest importance. Apparent decreases in the physical activities of children, awkward movements, and rapid fatigue are important indications. The localization of pain is frequently misleading. Muscular fixation is an early symptom. Pain on pressure permits localization of the lesion. It is of further importance to test for pain on weight-bearing. The lesion which begins usually near the anterior surface of the body causes collapse of the body; by anterior progression it causes paravertebral abscesses and by posterior progression spinal symptoms. X-ray examination is necessary in each case of suspected spondylitis. Paralyses during the early phase of the disease are due to pressure and local nutritive disturbances. In the late course they are usually due to specific involvement of the cord membranes. Rare cases of spondylitis heal spontaneously, leaving practically always a slight gibbus. In the treatment of progressive cases the most important principles are avoidance of weight-bearing and rest. Fixation operations do not improve the prognosis nor do they shorten the disease; this is supposed to be particularly true in children. Photographs designed to show the contrary are said to be rather a proof of photographic than of therapeutic efficiency. The treatment can hardly be shortened below 4 or 5 years. About 20 per cent of all patients with tuberculous spondylitis die in spite of treatment, on account of complications such as meningitis, amyloidosis or miliary tuberculosis. In the early diagnosis of tuberculous coxitis a close observation of symptomatology is again of utmost significance. The first pain is frequently localized in the region of the knee. The earliest limitation of movement is evident on hyperextension. In the early part of the disease X-ray examination may not reveal any abnormality. In the treatment of coxitis the same principles prevail as in the treatment of spondylitis. Purely synovial forms may heal with normal function. Fixation operations do not decrease the frequency of recurrence.—*Zur Skelett-Tuberkulose, A. Wittek, Wien. klin. Wchnschr., November 27, 1931, xliv, 1489.*—(*M. P.*)

Tuberculosis of Intervertebral Articulations.—Tuberculous infection of the spine usually occurs by the haematogenous route. The various types of spinal involvement are described depending upon the blood-supply. Emphasis is laid upon tuberculous involvement of the intervertebral articulations. In this type early clinical diagnosis is difficult because of lack of deformity, and the roentgen examination must be the chief reliance for early diagnosis. The early roentgen signs are narrowing of the intervertebral disc together with erosion of the articular surfaces, but with preservation of the body form.—*Tuberculosis of the Intervertebral Articulations, H. P. Doub and C. E. Badgley, Am. J. Roentgenol. & Rad. Ther., March, 1931, xxv,* 299.—(*W. I. W.*)

Surgical Treatment of Tuberculosis of Knee.—Tuberculosis of the knee joint does not always necessitate the mutilating surgical measures which are too commonly used among many orthopaedic surgeons. In the majority of cases the patients remain totally disabled; they sometimes develop indolent sinuses and fistulae, and not infrequently new foci of the disease appear elsewhere in the body, especially in the lymphatic system. Surgical intervention is definitely indicated in certain types of cases with centrally located foci surrounded by normal tissues. In other patients operation must be performed for the relief of intense pain or to avoid progression of the disease when the lesion is strictly closed and of long duration. When athrotomy becomes absolutely necessary, it should be limited to incision and drainage. Since 1912, fifteen hundred cases of tuberculosis of the knee have been treated by remedies dependent upon their local chemical action in conjunction with well-known hygienic measures. The patients recovered quickly and articular function was restored, when ankylosis did not exist at the beginning of treatment.—*Si deve operare nelle artropatie tubercolosi del ginocchio, O. Marroni, Tubercolosi, September, 1931, xxiii, no. 9, 317.*—(*U. E. Z.*)

Diagnosis of Bone and Joint Tuberculosis.—In recent years tuberculosis statistics have been subjected to criticism because

of the alleged inclusion of case material that was not tuberculosis. In a review of 88 cases of patients that were seen in the department of orthopaedic surgery of the State University of Iowa, and eventually accepted as Legge-Perthes disease, it was found that 31, or 35.2 per cent, had been diagnosed as tuberculosis on first admission. Operative fusion being frequently indicated in tuberculosis, a positive preoperative diagnosis is much to be desired before proceeding to the permanent eradication of joint function. In the records of ten years, 986 patients of the author's series remain listed as being tuberculous. The pathological files were examined, and 142 of these cases were obtained which had been verified in the pathological laboratory. This group of definitely tuberculous cases was then critically analyzed from the standpoint of clinical diagnosis. The classical picture emphasizes particularly the insidious onset of joint tuberculosis. The observations in this series partially sustain this generalization in that the average duration of all lesions to pathological verification was 3.1 years. But in 29.5 per cent the onset was sudden. In this group 61.9 per cent were incorrectly diagnosed and only 38.5 per cent correctly diagnosed. The variability of signs was marked, and statistical analysis of factors, such as the degree of muscle spasm, muscle atrophy and functional limitation, was not found possible. The monarticular or local character of surgical tuberculosis appears to be overstressed in the classical descriptions. In this series of proved cases 35, or 32.7 per cent, presented two or more lesions. In several cases this was responsible for a diagnosis of chronic infectious arthritis, corrected only after biopsy. Roentgen examination, while usually helpful, was often the reverse. In 53 cases, such examination was of no aid or was misleading. The X-rays are merely a useful adjunct. Tuberculin tests were performed on 103 of this group; 83 were positive and 20 were reported negative. When the test was repeated on nine of the twenty, positive reactions with controlled intracutaneous injections of graduated doses of bovine and human tuberculin were obtained in eight. The necessity of not accepting a report of a single dose of tuberculin as a negative report was apparent. Of all the simple diagnostic aids, a carefully controlled and repeated intracutaneous tuberculin test, if negative, is of greatest value in excluding tuberculosis. In 12 cases of this series, section of a tissue removed for biopsy failed to reveal the nature of the lesion. "Chronic inflammation" alone could be diagnosed. Inoculation of guinea-pigs, however, demonstrated the organism in each of these 12 cases. The isolation of the organism is the only conclusive evidence.—*Diagnostic Inaccuracy in Tuberculosis of Bone, Joint and Bursa, J. E. Milgram, J. Am. M. Ass., July 25, 1931, xcvii, 232.*—(*G. L. L.*)

Early Diagnosis of Tuberculous Joints.—The early diagnosis of tuberculous disease of the joints is often difficult. In early cases, aside from the clinical signs of irritation, there exists only an atrophy of bone, which can also be the expression of a protection against a toxic agent. In order to simplify the differentiation both limbs are put at complete rest in a plaster cast surrounding both sides. After the removal of the casts tuberculosis is probable if the bony atrophy on the diseased side has become more marked than on the other. If the atrophy of both sides is the same a tuberculous coxitis does not exist.—*Ein Mittel zur Frühdiagnose tuberkulöser Gelenkerkrankungen, F. Schede, Centralbl. Chir., 1930, lvii, 2658.*—(*H. J. C.*)

Lipolytic Ferment of Blood in Bone and Joint Tuberculosis.—In children with mild forms of bone and joint tuberculosis the lipolytic power of the blood is increased in the majority of cases. With improvement of the condition the blood lipolysis increases, while with progression of disease it decreases. The action of the lipolytic blood ferment allows no prognostic conclusions, however. Following subcutaneous injections of codliver oil and fresh butter the lipolytic power decreases in dogs. Perorally, butter and codliver oil increase the lipolytic power of the blood in children and in dogs. Subcutaneous injections of arsenic preparations increase the lipolytic power of the blood in children and rabbits. The lipolytic power of the blood is also increased by quartz-lamp raying. Tuberculin treatment causes a decrease in the lipolytic blood-ferment initially, followed in the majority of cases by an increase.—*Der Gehalt des Blutes an lipolytischem Ferment bei der Knochenund Gelenktuberkulose und dessen Schwankungen bei verschiedenen Massnahmen, M. M. Altschuler, Beitr. z. Klin. d. Tuberk., 1930, lxxiv, 479.*—(*H. J. C.*)

Poncet's "Rheumatism."—A chronic symptomless pulmonary process, with miliary dissemination, caused acute joint changes leading to ankylosis. Since a bacteriological determination of the joint processes was lacking the pulmonary process with chronic disseminated tuberculosis was regarded as explaining the joint disease as a Poncet's rheumatism. The case is also used to support the theory of a bacillary genesis

of Poncet's disease and to suggest its pathogenesis as resulting from a haematogenous seeding of tubercle bacilli.—*Poncetscher Rheumatismus und generalisierte Lungentuberkulose, Anne-Marie Cohn, Ztschr. f. Tuberk., 1930, lviii, 172.—(H. J. C.)*

The Origin of Male Genital Tuberculosis.—The author studied the genital organs in 69 cases dying of tuberculosis and never found tubercle bacilli in the unchanged organs. The capillaries and lumina of the seminal vesicles were free from tubercle bacilli. An excretion of tubercle bacilli from unchanged genital organs is considered unlikely. The first tuberculous metastases develop from the blood-stream as interstitial tubercles without any relation to the lumina. In 4 cases of miliary tuberculosis the male genital organs showed beginning tubercles, particularly in the prostate, and in one case in a seminal vesicle. Here also an excretion of tubercle bacilli through anatomically unchanged tissues did not exist. The tubercle bacilli could be found only in the interstitial tissues and in the vicinity of vessels. With tubercle bacilli present in an ejaculatory duct the overlying ducts were free from tubercle bacilli. Tuberculous disease of the kidneys and the genital tract developed independently of each other. Tuberculosis of the prostatic urethra occurs mostly as an end-result of tuberculosis of the genital organs, and arises from the excretion of tubercle bacilli from a tuberculous spermatocystitis. The submucous tubercles of the prostatic urethra are resorption tubercles.—*Zur Entstehung der Tuberkulose der mannlichen Geschlechtsorgane, J. Lehmann, Virchow's Arch., 1930, cclxxvii, 537.—(H. J. C.)*

Pyelography in Renal Tuberculosis.—Renal tuberculosis may be acute or chronic, primary or secondary. The symptoms of onset are insidious, and not referable to the kidney until the disease is well advanced, but there may be a dull, aching pain in the region of the kidney, accompanied by slight to moderate tenderness on pressure and frequent and painful urination. Ureteral catheterization may be necessary in order to identify the involved kidney. Ascending pyelography is a procedure that should be avoided because its dangers outweigh its advantages. Intravenous pyelography will visualize the urinary tract, and at the same time obviate the necessity of a general anaesthetic, the shock of instrumentation and the dangers of dissemination of the disease. The purpose in reporting 5 cases is to demonstrate that the method is of value in visualizing the tuberculous kidney, ureter, and bladder, and that it will show at least gross pathological deformities in both kidneys and ureters. Also, some knowledge of the relative excretory power of the two kidneys can be gained, and a more satisfactory knowledge of the extent of the lesions may be obtained. The method is simple, direct and painless, and, in these 5 cases at least, it has been absolutely harmless. The substance used to visualize the urinary tract is *uroselectan*. It is nontoxic, readily soluble in water, contains 42 per cent iodine, and is excreted by the kidneys in sufficient concentration to give a good roentgenographical contrast with the usual technique. Apparently it is excreted through the kidneys unchanged in form; iodism has never been observed; therefore it is harmless in tuberculosis. The technique of preparation and administration of the drug, together with the preparation of the patient and X-ray technique, is extremely simple. One package of 40 gm. of uroselectan is completely dissolved, by gradually adding it to 80 cc. of previously heated, double-distilled water. The volume is increased to 110 cc. This is filtered twice, and then sterilized by heating over a steam-bath for twenty minutes. The solution when cooled to body temperature should have a volume of 110 cc. For obese patients, 60 gm. are necessary, and in such cases three packages are dissolved in 220 cc. of water and 110 cc. of the solution used. The cooled 110 cc. is injected intravenously in two parts, allowing a brief interval between injections. The patient has a sensation of warmth, particularly over the face and vesical regions. After the radiographs have been made, the patient may resume his usual routine. In preparing the patient, the bladder is emptied and a preliminary roentgen examination is made before the uroselectan is injected. A slight modification of the X-ray technique may be necessary in order to obtain good photographic contrast. The customary immobilization, the use of the grid, and the usual urinary tract "set-up" is employed. Separate films of either or both kidneys and the lower portion of the tract should supplement the routine 14 x 17 film. The first urogram may be made fifteen to twenty minutes after the injection and four subsequent exposures may be made at intervals of fifteen to twenty minutes. The patient should be permitted to void after the second exposure, as overdistention of the bladder hides the lower portion of the ureters. The period of maximum visualization may be determined by fluoroscopic examination. The more normal the renal function, the greater the concentration, the more rapid the elimination, and the clearer the X-ray visualization. Therefore, the time of excretion and X-ray

delineation constitute a rough method of estimating the renal function on each side. In these 5 cases, even though marked deformity of the renal pelvis might be noted, the function was good. The ability of the tuberculous kidney to do its work in spite of severe anatomical changes is apparently remarkable.—*Intravenous Pyelography in Renal Tuberculosis, R. T. Pettit and R. W. Dunham, Radiology, July, 1931, xvii, 113.*—(*H. S. W.*)

Tuberculosis of Ureter.—Tuberculous involvement of the ureter is a frequent complication of tuberculosis of the kidney. The ureters become shortened and stiffened and can be seen on a roentgenogram by means of opaque catheters. These findings may be the first X-ray evidence of tuberculosis of the kidney, as observed in the two cases reported.—*Tuberculosis of the Ureter, with Two Case Reports, L. Bryan and J. Levitin, Radiology, August, 1931, xvii, 345.*—(*T.O. R.*)

Endocrine System in Tuberculosis.—Glands of internal secretion suffer certain changes during the course of tuberculosis. The author studied 68 cases of various forms of pulmonary tuberculosis, especially with regard to the so called "endocrine constellation." In acute cases of pulmonary tuberculosis the thyroid was double the size of that in chronic cases of tuberculous toxaemia, and the former showed an increased colloid-formation and hyperplasia of the follicles, while the chronic cases displayed secondary atrophy of the follicle with fibrosis. In the chronic cases there was a diminution of the islets of the pancreas and a decrease in size of the islet cells, while in the acute cases there was swelling of the islet cells. In asthenic cases there was found regularly a hypoplasia of the cortex of the adrenals. The weight of the adrenals was normal, being slightly higher in the chronic fibroid cases of tuberculosis than in the acute cases.—*Veränderungen und Struktur des endokrinen Systems bei Tuberkulose, W. Stefko and M. Tscherokowa, Beitr. z. Klin. d. Tuberk., 1930, lxxiii, 791.*—(*H. J. C.*)

Tuberculosis of Skin.—Tuberculosis of the skin develops almost exclusively in individuals with disease of the internal organs, and its course is favorable and deaths are rare. In the Moscow Lupusorium there were only three autopsies on cases of lupus within 8 years, and two of these had miliary tuberculosis, while in the third case there was no tuberculosis of the internal organs. In one case there was widespread proliferative tuberculosis of the skin and the mucous membranes of the face, which healed completely, and the patient died 6 years later of a generalized disease. It appears that cases of lupus and pulmonary tuberculosis of stage I take an unfavorable course, while widespread closed tuberculosis of the second stage and active pulmonary tuberculosis have a favorable course. Excised lupus nodules caused in guinea pigs, following intraperitoneal injection, a slowly progressive and predominantly or purely productive tuberculosis of the internal organs. A virus of diminished virulence appears to be encountered.—*Die Tuberkulose der Haut und ihre Wechselbeziehungen zur Tuberkulose der inneren Organe, S. S. Wail, Virchow's Arch., 1930, cclxxvii, 115.*—(*H. J. C.*)

Capillaries in Healing Lupus.—Microscopic examination of the capillaries in lupus has been applied recently, particularly in cases under therapy with salt-free diet. The new small foci of lupus are surrounded by circles of minute blood-vessels which penetrate the diseased area itself. As the foci become larger, there develops another circular vessel-wall, from which again capillaries sprout into the centre of the focus. At the stage of cicatrization, these blood-vessels retrogress markedly. The healed focus shows only a single cicatrix, which may remain unchanged for months when a residuum may blossom out again into an active focus, whereas the unhealed area is peripherally vascularized. After ultraviolet therapy and after salt-free diet, there is a marked increase in the capillaries and pigmentation of the foci.—*Kapillaroskopische Kontrolle der Lupusheilung, Bettmann, Deutsche med. Wchnschr., January 16, 1931, lvii, 89.*—(*H. S. W.*)

Purpura and Tuberculosis.—A boy of 8 years was hospitalized because of increasing pallor dating from an attack of headache, convulsions, and a transitory generalized eruption five months previously. In addition to a sallow complexion, the patient on admission had hemorrhages in the fundi, palpable liver and spleen, platelet counts of 60,000–100,000 per cu. mm., prolonged bleeding time, and failure of clot retraction. A roentgenogram of the chest was negative. The bones of the feet and ankle were the seat of generalized rarefaction. The intracutaneous tuberculin test was negative to 5.0 mgm. The patient developed purpuric spots in the hospital, and later *Streptococcus haemolyticus* septicaemia, associated with a mild upper-respiratory infection. His pallor meanwhile became intensified, and the

white cells fell from 4,800 per cu. mm. (46 per cent polymorphonuclears and 52 per cent lymphocytes) to 750 per cu. mm. (83 per cent lymphocytes and 16 per cent metamyelocytes). Numerous petechiae appeared before death. Necropsy revealed haemorrhages in the bone-marrow, spleen, skin, and stomach; bacterial infarction in the lungs and suprarenals; osteoporosis of the tibia and tarsi; and tuberculous lymphadenitis. The last diagnosis was based on the finding microscopically, in the hard but not particularly enlarged mediastinal lymph nodes, of areas of coagulation necrosis, epithelioid reaction, and giant cells. Dr. A. A. Rich reported a section of one of these glands as "certainly characteristic enough of a tubercular infection, for the most part entirely healed." This finding was especially noteworthy in view of the negative reaction to 5.0 mgm. of tuberculin intracutaneously. The case was considered as idiopathic purpura hemorrhagica, coincident with tuberculous lymphadenitis, for the most part healed, the agranulocytopoenia probably due to bacterial infection and toxaemia. —*Purpura Hemorrhagica Associated with Healed Glandular Tuberculosis, A. M. Litvak and T. G. Holzsager, Am. J. Dis. Child., November, 1931, xlii, 1160.*—(*M. D.*)

Purpura and Tuberculosis.—While instances of purpuric symptoms have been described frequently in adults and older children with tuberculosis, no cases in early infancy have previously been reported. This patient, a 2-months-old child of a tuberculous father, was hospitalized because of vomiting and an enlarging abdomen. She developed purpuric spots and haemorrhagic tendencies, relieved only by transfusion. The platelet count was 79,000 per cu. mm. The child died suddenly nineteen hours after admission, necropsy revealing extensive miliary tuberculosis. The work of Schlack (1926), demonstrating a decrease in the number of blood platelets in tuberculous children following the tuberculin test, raised the question of the possibility that this process aggravated the bleeding tendency in the patient reported, since the bleeding first became pronounced about one hour following the routine diagnostic test with tuberculin.—*Miliary Tuberculosis with Purpura in Infancy, M. S. Gaede and J. O. Vaughn, Am. J. Dis. Child., October, 1931, xlii, 869.*—(*M. D.*)

Differential Diagnosis of Tuberculous Meningitis.—Tuberculous meningitis and encephalitis may resemble each other closely and may offer serious difficulties in the way of differential diagnosis. In a case which clinically resembled tuberculous meningitis, the Pirquet test was positive, X-ray of the lung was negative, and several punctures revealed clear fluid with a count varying from 39 to 172 cells, mostly lymphocytes; the pressure was normal and the globulin was faintly positive; the earlier specimens of spinal fluid contained a fibrin pellicle which revealed no tubercle bacilli; the later ones contained no pellicle. Gradually the meningeal symptoms subsided and the patient was discharged nine weeks after admission, with the diagnosis of encephalitis which was made early in the course of the disease because of the following considerations: (1) the fibrin web of the fluid is not pathognomonic of tuberculous meningitis; (2) in tuberculous meningitis, the fluid is usually under increased pressure; (3) in this affection, the cell count is usually higher than that found in this case; (4) increase in cells with only faint traces of globulin is very frequent in encephalitis.—*Differential-diagnose der Meningitis tuberculosa, O. B. Bode, Deutsche med. Wchnschr., January 9, 1931, lvii, 54.*—(*H. S. W.*)

Key to Abstractors

H. J. C.: H. J. Corper, Denver, Colorado.
F. G. P.: Frank G. Petrik, Loomis, New York.
J. S. W.: J. Stanley Woolley, Loomis, New York.
H. S. W.: H. S. Willis, Northville, Mich.
J. P. B.: Joseph P. Bobbio, Northville, Mich.
G. L. L.: George L. Leslie, Howell, Mich.
M. E. P.: M. E. Parker, Kalamazoo, Mich.
U. E. Z.: U. E. Zambarano, Providence, R. I.
M. P.: Max Pinner, Tucson, Arizona.
W. I. W.: Walter I. Werner, Pontiac, Mich.
R. M. F.: R. M. Franklin, Loomis, New York.
T. O. R.: Teckla O. Rosenbusch, Northville, Mich.
M. D.: Max Deutch, St. Louis, Missouri.